GAS JOURNAL

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GAS IN SCOTLAND

THE new Scottish Association of Gas Managers held its first regular meeting on April 18 under the presidency of Mr. E. G. Smith, Deputy Divisional Controller of the Glasgow Division of the Scottish Gas Board. Mr. Smith very appropriately opened his address—see later pages—with a brief sketch of the history of the amalgamation; he appended to the printed copy a short historical note on the two constituent bodies, the Waverley and the North British Associations, now so happily united. It is perhaps to be regretted that the new body is only affiliated with and not yet incorporated in the Institution of Gas Engineers. It is to be hoped that the tie may eventually become closer. Most of its members are already chartered gas engineers and we are quite sure that the standard of qualification and professional ability of its members is already as high as that now existing in any of the new sections of the Institution and that it will advance in step with theirs.

It was meet and right that the first President of the Scottish Association should extend his view over the whole field of the gas industry in Scotland and that he should begin with education and recruitment. He is concerned that the raising of the standard of education shall 'add further to the prestige of our Institution and its members.' He sees the difficulties in the way of an adequate rate of recruitment of personnel to the industry, particularly in the grade of technician. The direct influence of the local gas engineer among the ruling citizens of his township is not gone, but it would appear to be inevitable that it should be somewhat lessened. On the other hand, the opportunities to be offered to the young student are now nation-wide. The problem is how to present the prospects to the student making up his mind about his future career, how to put up effective competition against the attractive publicity of industrial firms with long experience in recruitment and training. A solution is not impossible but practical measures are not yet much in evidence.

The President turned to coal and carbonisation. Coals from the Scottish mines are not unique in their increase in ash content with the inevitable and to some extent consequential decline in swelling index and coking power. The President notes the marked predominance of the continuous vertical retort in Scotland which he attributes to the ability of the continuous vertical retort to handle Scottish coals. It could be put the other way. Most Scottish coals are very easily treated in the continuous vertical retort. Scotland might be described as the 'happy hunting ground' of the continuous vertical. The cokes are so reactive to steam that gas of a pretty low declared calorific value can be produced in one operation without loss of thermal output per retort (sometimes with a decided increase in output per retort) and with increase in fuel consumption so small as to be in some cases negligible. In one works of considerable capacity it was shown that 450 gas could be produced with a fuel consumption less than 10%. So marked is this combination of properties in the Scottish coals that declared values can be economically much lower than they are in England. Indeed, that is usually the case. It may be that further coal economy could be achieved by reducing further to values lower than those which are in fact in vogue. Peak loads can and should be taken up by carburetted water gas (requiring less oil the lower the declared calorific value), but in the smaller undertakings it has been shown that wide variations of load can be taken up by the continuous vertical retort itself.

Mr. Smith's analysis of the position of the continuous vertical in Scotland is comprehensive and able, but it is probably a little coloured by the unique position of the great industrial district in which his immediate interest lies. There will, however, always remain in Scotland a comparatively large number of isolated medium and small works where the continuous vertical retort, powerfully favoured by the properties of Scottish coals, will remain an incomparably flexible instrument for the

production of town gas. Coke ovens designed for the requirements of the steel industry may be fitted into the picture. But, as he suggests, coke producers must be brought within the provisions of the Gas Act at least in regard to continuity of supply if they wish to avail themselves of the market for their surplus gas.

Mr. Smith's remarks on capital expenditure and particularly his incidental reference to the integration of Dumbarton with its neighbouring undertakings are also of great interest. On the subject of load development there would appear to be scope indeed for a considerable extension of industrial and commercial sales in Scotland's highly industrialised belt; it came as something of a shock to hear how much less this is than the average of the industry as a whole. He concluded with a brief note on the gas industry's place in the national fuel policy, awaiting as we all do the report of the Ridley Committee and, as we all hope, some evidence that the new co-ordinating Minister of Fuel and Transport will some day produce the missing policy.

WIND, SUN, AND TIDE

IN the general talk about how we should use coal to the best advantage in view of the ever-increasing demand for energy there have concurrently been many observations on the harnessing of 'supplementary' sources of power—wind, sun, and tides—sources which 'offer little prospect of rich returns within a short time and thus interest mainly those who are intellectually curious or those who look far ahead.' The words quoted are from a recent and most interesting paper given by Mr. C. W. Marshall, Deputy Chief Engineer to the British Electricity Authority, to the Royal Society of Arts. We believe that many are 'intellectually curious' regarding the application of these supplementary sources and that more are looking ahead. Certainly the subject holds fascination, and in fact men of the highest competence are engaged in investigating the problems involved and assessing the possibilities of practical success.

A great deal of information has already accumulated as the result of experiment, notably in America, France, Denmark, and the U.S.S.R., in the generation of electricity from the wind, and though the results would not encourage heavy private investment in wind power developments, wind power is, quite rightly, being fostered at high level in Great Britain. According to Mr. Marshall, the justification for this research seems to lie primarily in the fact that on the long-term view it will become essential to eke out our irreplaceable fuel resources by all available means. It also seems probable that wind energy might be used particularly economically in this country because of the high average wind speeds on the west coast and because all energy could be absorbed conveniently through the medium of the national electricity system—the grid. Two generators of a capacity of 100 kW have, in fact, been ordered. One of these, the property of the North of Scotland Hydro-Electric Board, has been erected on the Costa Head site in Orkney; the second, ordered by the British Electricity Authority, will be erected on the Mynydd Anelog site in Caernarvonshire, after it has undergone preliminary tests near St. Albans. To be competitive with coal-fired plant in this country the wind plant must produce energy at a cost of 0.4d. per kWh. The performance of these two machines will provide evidence of the potentialities of wind power which should decide our wind power research and development for the next decade or more; and the author stated that successful operation of the pilot plants will mean a possibility of obtaining at least as much energy from the wind as is now being obtained from hydro plant south of the Clyde-Forth line.

Discussing solar energy, and the heat pump in particular, Mr. Marshall described American technical contributions to progress in the design and applications of the heat pump. In comparison our own developments are fragmentary, though we have had the advantage of a long start before everybody else, because of Kelvin's statement of the fundamental principles of the heat pump nearly a century ago. The author's own experience in England has revealed one phenomenon in connection with education which he thinks might with benefit be exploited in regard to thermal storage and heat pumping. His feeling is that wherever a subject, however erudite it may be, or may have been made to appear, becomes interesting to the general public, the amateur or near-amateur usually outclasses the professor and the professional. And he would not be surprised—provided the technical development was revealed sufficiently clearly—if the British public were to take charge of the heat pump development in a year or two.

Turning to tidal energy, in this country the outstanding example of a proposed tidal energy scheme is that of the Severn estuary, which has interested engineers for the past 100 years or so. The most recently published official scheme envisaged an annual output of about 4% of the present annual consumption of electricity. Each project to realise the scheme has been put aside because the estimated cost of construction greatly exceeded the ruling prices of an equivalent capacity of thermal power plant. Now that supplies of coal are becoming more and more difficult to obtain, interest in the Severn scheme is reviving and some high-grade man-power is being devoted to working out details of the civil construction and power plant, but the indication is that 'tidal power ranks lower than wind power as a potential national asset.' We have quoted freely from Mr. Marshall's paper, which is a most useful analysis to anyone interested in the broad question of the use of fuel and the production of energy. And while there will be general agreement with the author's contention that a dispassionate survey of our energy balance-sheet will show that there are many more direct and immediate means of improving it than by exploring these 'supplementary' sources, it is to be hoped that 'some proportion of our mental effort, supported by experiment where necessary, will continue to be used in solving problems which can bring returns only after many years.'

INDUSTRIAL GAS CONFERENCE

THE opening of the British Industries Fair turns our thoughts to the contribution which gas makes to industry, a contribution the growth of which is so remarkable as to be even a little alarming. Consider the facts: The comparatively small number of industrial consumers served by the gas industry (some 114,000, embracing 4,000 trades) account for a quarter of the total gas sold each year. In the West Midlands the industrial load last year accounted for about 45% of the total gas sold, an increase of 11% over the previous year; in the Sheffield and Rotherham Division of the East Midlands Gas Board the percentage rises as high as 69%. It is to industry, therefore, that we must look, more and more, for our future expansion and prosperity. Is this fact sufficiently appreciated by the gas industry? We doubt it; but there is no doubt in our minds that the Gas Council's efforts to promote research, public relations, and publicity on gas in industry are fashioned with their imminent expansion well in mind. The Council's approach to the British Industries Fair is a clear example of this. Following last year's pattern, they not only devised a most impressive stand at the Fair and a strong Gas Section (these are described at length on p. 308 *et seq*), but also arranged, on May 5, an Industrial Gas Conference in Birmingham.

The meeting on Monday last, which preceded the official visit to the Fair, was a happy occasion, a gathering together of those whose concern it is to develop the industrial load, enhanced by the presence of Colonel Smith and Mr. Jones and a very proper showing of area board chairmen and deputy chairmen, and a guest speaker who was prepared to speak his mind. This was Mr. J. Walker, a Director of the Morgan Crucible Co., Ltd., whose address was praised no less in the lobbies than on the platform.

Weighing anchor with a cheerful smile, Mr. Walker was in deep water in no time. Many in industry, he said, believed that the gas-making programme was too small. It had been suggested that this programme might have been restrained in an endeavour to be realistic and that it represented a sensible demand on scarce materials, scarce capital, and the not unlimited resources of the gas plant contractors. Such stark naked thinking, he suggested, would certainly be appropriate to the times, but if indeed this was the trend of thought, he trusted it would go further and promote the frugality that planned chiefly in terms of plant renewals, reconstruction, simplification, rather than a smaller programme of more elaborate innovation. But, he asked, was this restraint in forward planning really realistic?

Clearly Mr. Walker thought not, and suggested that timing might be the key to the problem. Was the industry looking back at the relative slowness of past progress in industrial use of gas and thence underestimating the possible rate of future progress? And he pointed out that the Heyworth report had predicted a 20% increase in gas sales between 1945 and 1955, when in fact by 1949-50 gas sales rose by over 27%; moreover, the F.B.I., in submitting evidence to the Committee on National Fuel Policy, had stated that, judging by present trends, there should be a 40% increase in coal consumption in the gas industry by 1960-65. 'The situation,' he added, 'deserves that all bodies able to speak with authority should give the Government, through every appropriate channel, a bold, forward-looking picture of the rôle the gas industry has in a sound national fuel policy.'

AS OTHERS SEE US

TURNING from quantitative to qualitative features of the situation, Mr. Walker had some interesting comments to make on the development of industrial gas equipment. Giving full marks to drying processes ('progress in this field has been one of the outstanding examples of initiative and education by the gas industry'), he called for improved design in space heating appliances, automatic combustion control for continuous furnaces, approved lists of appliances, and sensible standardisation.

Of market conditions he pointed out that for something like 12 years some British industries had not had to worry enough about quality and cost; the prolonged sellers' market and the many difficulties of getting new equipment had not provided much incentive to pursue a progressive policy. Mr. Walker added: 'It won't do and it won't last and, thank goodness, many have not been lulled into a sense of false security. Industry has by taxation been heavily drained of its resources for fresh capital investment. The pleas for taxation relief on fuel-saving schemes should be strengthened and pressed home.'

We particularly endorse his views on recruitment and training: 'Consumer service is interesting work for good calibre men and if the gas industry has difficulty in finding enough of them, it must to some extent blame its own modesty in not publishing as actively as some other industries its potentialities for employment or its excellent staff training schemes.' And he pleaded for a thorough practical knowledge of modern refractories and their usage to be given trainees, but, he added, 'it won't be easy to provide—much of the available literature is not at all helpful and the subject is treated with scant courtesy in many educational establishments; refractory manufacture is undergoing a revolution and the extended use of gas and these refractories must go hand in hand.'

In Mr. Walker's view industry wants to see: True recognition of the rôle the gas industry has to play in the national economy; much more gas with constancy in supply, pressure, C.V., and burning qualities; a high standard of gas cleanliness; simple, flexible, and robust appliances of approved performance; inexpensive and foolproof safety appliances; and—this was one of his major points—plenty of practical consumer service *on the shop floor*. As for price, we quote: 'Industry wants large quantities of gas—often round the clock—rarely for short peaks. The industrial gas demand is, therefore, essentially a flywheel or base load—a spreader of on-costs—and, as such, must be priced on its merits.'

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Personal

EAST MIDLANDS APPOINTMENTS

The East Midlands Gas Board has approved the following appointments with effect from May 1. They conclude the chain of appointments consequent upon the appointment of Mr. Henry F. H. Jones, as Deputy Chairman of the Gas Council. **Mr. H. B. Taylor,** Manager of the Nottingham Sub-division, to be General Manager, Leicester and Northants Division; **Mr. J. S. Fox-Andrews,** Divisional Engineer, Leicester and Northants Division, to be Manager, Nottingham Sub-division; **Mr. R. Hutchinson,** Group Manager, Northampton, to be Divisional Engineer, Leicester and Northants Division.

As from May 1, the Northampton Sub-division has been dissolved. The undertakings are already formed into groups, and, in future, the group managers will be directly responsible to the Divisional General Manager, Leicester and Northants. **Mr. J. Corrigan,** Senior Group Manager, Northamptonshire, to be responsible for the Northampton Group, comprising Northampton, Daventry, and Stony Stratford; **Mr. P. T. Harris,** Group Manager, Kettering Group, comprising Kettering, Desborough, and Rothwell; **Mr. D. A. Foster,** Group Manager, Wellingborough Group, comprising Wellingborough, Rushden, Oundle, and Thrapston.

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Mr. J. Miller Thomson, W.S., has resigned as Chairman of Alder & Mackay, Ltd., after 28 years' service, but will remain on the Board. He is succeeded by **Mr. H. E. Bennet,** who joined the Board in 1919.

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Mr. W. Hill, St. Helens, has been appointed Installations Officer to the South Lancashire group of the North Western Gas Board and takes up his new appointment in the department of the Group Sales and Service Officer immediately. Mr. Hill was Installations Engineer to the St. Helens Corporation Gas Department prior to his appointment as District Service Manager at St. Helens, which is the headquarters for South Lancashire.

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Alderman George Frederick Hamer, C.B.E., J.P., Chairman of the Wales Gas Consultative Council, has been re-elected, for the second year, to the Chairmanship of the Montgomeryshire County Council. Alderman Hamer, who is Lord Lieutenant of the County of Montgomeryshire, has been a member and Alderman of the County Council for many years and has served on most of the Committees, but has been most prominently asociated with the Education Committee, of which he was Chairman for several years.

1952 'Journal' Directory

THE following changes have been notified during the past month. To keep the information in the 1952 edition of the *Gas Journal Calendar and Directory* up to date readers are invited to note these alterations (together with the appropriate adjustments relating thereto in the 'Personal' section of the *Directory*, pp. 141-156):

Page 23.—NORTHERN GAS CONSULTATIVE COUNCIL: Add R. A. Cookson, O.B.E. (Newcastle) *Member.*
„ 25.—SCOTTISH GAS CONSULTATIVE COUNCIL: Add Councillor Scott Adamson, J.P., C.A. (Glasgow), Provost J. Grigor (Inverness), and Provost Alexander Macrae, B.E.M., J.P. (Dingwall). *Members.*
„ 76.—CLEVELAND: Delete G. Hamilton, *M* (removed).
„ 107.—MONMOUTH: Delete A. E. Pask, *E and M* (retired).
„ 115.—WEST MIDLANDS: J. T. Rees, *Sales and Service Manager,* and A. V. Horsfall, *Deputy Sales and Service Manager,* now at 58, Hagley Road, Edgbaston, Birmingham, 16. T/N Edgbaston 3682.
„ 117.—CHEADLE: C. J. Parsons, *E. and M.,* vice H. W. Allan.
„ 118.—WALSALL DIVISION: R. Lucas, A.I.M.T.A., *Div. Acct.,* vice T. F. Flynn. Delete A. Robinson, *Deputy Div. E.*
„ 118.—WEST BROMWICH: L. H. Thomas (Smethwick), *Senior Admin. Officer.*
„ 132.—BARRHEAD: A. Campbell, *M.*
„ 133.—DUNOON: G. Hamilton, *Dist. M.*
„ 133.—MILLPORT: P. B. Stewart, *Dist. M.*

INSTITUTION OF GAS ENGINEERS

THE following is the programme arranged for the 89th annual general meeting of the Institution of Gas Engineers, which will be held in London on May 27, 28, 29, and 30, under the Presidency of Mr. J. H. DYDE, Deputy Chairman of the Eastern Gas Board.

Tuesday, May 27:

10 a.m. Opening of the meeting at Church House, Westminster, S.W.1. Welcome to representatives from overseas; adoption of the 89th annual report and accounts; presentation of medals.

10.25 a.m. Presidential Address by J. H. Dyde.

11 a.m. to 12 noon. Presentation and discussion of paper on 'The Gas Industry in France: its Evolution, Programme, and Perspectives,' by J. Kec, President of the Association Technique de l'Industrie du Gaz en France.

12.45 p.m. for 1 p.m. President's Luncheon at the Savoy Hotel, Victoria Embankment.

3 p.m. to 4 p.m. Presentation and discussion of paper on 'The South Wales Gas Grid,' by W. R. Branson, Technical Officer, East Midlands Gas Board (formerly Engineer, Wales Gas Board), and W. T. Hird, Distribution Engineer, Wales Gas Board.

4 p.m. Special general meeting of corporate members to consider proposals for increasing the revenue of the Institution.

8 p.m. to 1 a.m. Reception and Dance in the Connaught Rooms, Great Queen Street, W.C.2.

Wednesday, May 28:

10 a.m. Presentation and discussion of paper on 'Oxide Purification in Towers. Some Aspects of Operation and Control,' by R. G. Warr (Engineer, Nechells works, Birmingham District), and E. T. Pickering (Deputy Chief Chemist, Central Laboratories), West Midlands Gas Board.

11 a.m. General meeting of contributors to the Benevolent Fund of the Institution of Gas Engineers.

11.15 a.m. to 12.15 p.m. Presentation and discussion of paper on 'Progress in Gas Purification,' by Dr. H. Hollings, O.B.E., Controller of Research, North Thames Gas Board.

1.45 p.m. to 6 p.m. Alternative visits to the Ponders End works of the Eastern Gas Board, the Gothic works, Edmonton, of Glover and Main, Ltd., the Fuel Research Station, East Greenwich.

Thursday, May 29:

9.30 a.m. Presentation and discussion of paper on 'Water-in-Tar Emulsions, with special reference to Sealing Media for Waterless Gasholders,' by S. C. Porter, Chief Chemist, Ipswich District, Ipswich Division, Eastern Gas Board.

10 a.m. Presentation and discussion of paper on 'The Technical and Economic Aspects of the Gas Supply to Four New Towns,' by W. A. Evetts, M.C., Divisional Engineer, Tottenham Division, Eastern Gas Board.

11 a.m. Presentation and discussion of paper on 'The Technical and Economic Aspects of Gas Manufacture in the Eastern Gas Board Area,' by E. O. Rose, Divisional Engineer, Tottenham Division, Eastern Gas Board.

12 noon to 12.15 p.m. Concluding business of meeting.

12.30 p.m. for 12.45 p.m. Council Luncheon to the President.

1.45 p.m. to 6 p.m. Alternative visits to the Ponders End works of the Eastern Gas Board, the Fulham Laboratories of the North Thames Gas Board, the Royal Festival Hall, the Maple Lodge sewage works, Rickmansworh, or the works of the Shredded Wheat Company, Ltd., Welwyn Garden City. There will also be a ladies' visit to the Roehampton Club, London.

Friday, May 30:

9 a.m. to 6.45 p.m. Motor coach tour to Hemel Hempstead New Town—Harpenden—Hatfield House/Luton Hoo.

Diary

May 8-9.—Wales and Monmouthshire Section, I.G.E.: Spring Meeting, Royal Gatehouse Hotel, Tenby.

May 9.—London and Southern Juniors: 'Design in Copper Tubing,' H. T. Wright (North Thames), 178, Edgware Road, 6.30 p.m.

May 10.—Scottish Juniors (Eastern): Annual General Meeting, Dunfermline.

May 14.—Western Juniors: Visit to Strachan and Henshaw, Ltd., Bristol. Paper by Mr. Grossmith (Strachan and Henshaw, Ltd.).

May 16.—Scottish Juniors (Western): Visit to Parkinson Stove Co., Ltd., Birmingham.

May 16-17.—British Gas Staff Association: Annual Conference, Harrogate.

May 19.—Eastern G.C.C.: Connaught Rooms, W.C.2. 2 p.m.

May 20.—London and Counties Coke Sales Circle: Annual General Meeting, Holborn Restaurant, 2.30 p.m.

May 20.—London and Southern Section, I.G.E.: Spring General Meeting, Chairman's Address by Dr. A. E. Haffner, Connaught Rooms, W.C.2, 2.30 p.m., preceded by Luncheon, 1 p.m.

May 20-23.—Illuminating Engineering Society: Summer Meeting, Eastbourne.

May 21.—South Western Section, I.G.E.: 'Present Day Distribution Procedure,' R. Marsh. At Plymouth.

May 21.—London and Southern Juniors: Visit to works of Benham and Sons, Ltd., Wandsworth, 2.30 p.m.

May 21.—Manchester Juniors: Visit to W. J. Jenkins & Co., Ltd., Beehive Works, Retford.

May 21.—Yorkshire Juniors: Visit to works of Whessoe, Ltd., Darlington. 'The Contractors' Place in the Gas Industry,' K. W. Francombe. (Whessoe, Ltd.)

May 21.—Northern Juniors: Special Speaker Meeting, 'The 1948 Gas Act and the Works Manager,' John F. Jackson, Secretary, Northern Gas Board; at Middlesbrough.

May 24.—Eastern Juniors: Annual General Meeting, Stamford, followed by afternoon visit to places of interest. Ladies invited.

May 24.—Scottish Juniors (Western): President's Day visit to Stirling gasworks.

May 26.—West Midlands G.C.C.: Dudley Room, Queen's Hotel, Birmingham, 2.30 p.m.

May 27-30.—Institution of Gas Engineers: 89th Annual General Meeting, London.

May 29.—North Thames G.C.C.: Westminster City Hall, 2.30 p.m.

June 3.—South Eastern G.C.C.: Caxton Hall, Westminster, 2.15 p.m.

June 4.—Southern G.C.C.: Grand Hotel, Bournemouth, 11 a.m.

June 5.—Midland Juniors: Ladies' Day.

June 7.—Scottish Juniors (Eastern): Annual Outing, Grangemouth.

June 9-10.—Eastern Section, I.G.E.: Spring Meeting, Grand Hotel, Sheringham. June 9: Golf and Bowls; afternoon meeting, with Chairman's Address by T. C. Battersby; evening reception. June 10: Business meeting, paper by G. E. Thomas, Industrial Gas Engineer, Watford Division; official luncheon.

Flame Hardening

AT the Market Hall, Leeds, showrooms of the North Eastern Gas Board, some 80 industrialists from all parts of Yorkshire recently met in the demonstration theatre for the presentation of a film on a new development in flame hardening with oxy-town gas.

The demonstration was given by Mr. L. C. H. Athill, Managing Director of Surfard, Ltd., who are the sole concessionaires in Great Brtain and the Dominions for this new German development, which is known as the Peddinghaus oxy-town gas system of flame hardening.

Mr. A. Higgs, the Board's Industrial Engineer, opening the meeting, mentioned that a gas industry productivity team which visited Germany shortly after the war was greatly impressed by the Peddinghaus development and tried unsuccessfully to bring a prototype machine back to this country. Surfard, Ltd., were to be congratulated on making this equipment available to British industry.

After the film had been shown Mr. Athill invited questions and the platform party, which comprised Mr. Athill, Mr. Higgs, Dr. M. L. Becker, Head of the Department of Metallurgy of the British Iron and Steel Association and a Director of Surfard, Ltd., and Mr. N. Hudson, the Chief Commercial Officer of the N.E.G.B., answered points made by the audience. A lively discussion followed, much interest being shown in specimen jobs which had been hardened by the Peddinghaus system.

The meeting ended with a vote of thanks to Mr. Athill, who, in turn expressed his appreciation to the North Eastern Gas Board for their co-operation in presenting the film demonstration

PACKING STRAW DANGER

Main-Laying Contractors Fined

THE gas engineer must necessarily make himself familiar with the provisions of a great number of Acts of Parliament—many of which do not appear to be directly concerned with the industry in which he is engaged. Among Acts he might feel tolerably certain he could not fall foul of in the course of his everyday duties is the Diseases of Animals Act. To show how wrong he would be in this assumption we refer to a case last week at the Alresford (Hants) magistrates' court which is not without importance to all public utility undertakings operating in rural areas. While this particular case related to the laying of water pipes it would be equally applicable to gas mains, since the type of piping used is often identical.

A firm of contractors engaged on a large water supply scheme for the Winchester Rural District Council was prosecuted on two counts for allowing straw which had been used for packing to come into contact with livestock, contrary to the provisions of the Diseases of Animals Act. (The clause is, of course, intended as a safeguard against the spread of foot-and-mouth disease, which, as is well known, is seriously prevalent in this country at the present time.) The packing straw which was the subject of the prosecution was that forming the protective band round the spigot end of Stanton spun-iron pipes. According to the evidence, the contractors had, in the one instance, stacked a number of pipes bound with straw in a field in which cattle were grazing preparatory to laying the water main; and, in the other case, had left surplus pipes in a field after the main had been laid, and cattle were turned into this field before the pipes were removed. For the defence it was stated that it was customary to leave the protective straw on the pipes till the last possible moment before laying and then to bury it in the trench or burn it. The contractors had since taken steps, however, to remove and destroy the straw from all pipes immediately they were delivered on the site of the main.

The firm was convicted and fined on both counts, the chairman of the bench remarking that it was a case of considerable interest. At a time when the gas industry is engaged in many schemes of mains linkage and extensions across agricultural districts it is well to bear this case in mind. It should also be noted that the mere removal of the straw band before stacking pipes in the vicinity of livestock, while complying with the law, is not of itself a complete safeguard. It is possible for infection, if present, to exist on the pipes for a day or two after the carrier has been destroyed.

Chemical Engineering Wiltons, Ltd., announce that they have received the contract from the East Midlands Division of the N.C.B. for the tar works to be built in conjunction with the new Avenue Coke Ovens near Chesterfield. The works will comprise a 'Wilton' continuous tar distillation plant and ancillaries for the concentration of tar acids, production of naphthalene and blending for road tars and pitch creosote.

East Midlands Gas Board Holds Its

Third Staff Conference at Skegness

EXACTLY three years after the nationalisation of the gas industry Mr. Sydney Smith, who succeeded Mr. Henry F. H. Jones earlier this year as Chairman of the East Midlands Gas Board, opened the Board's third annual staff conference at Skegness on May 1. As on the two previous occasions the programme was a heavy one, with addresses on the first day by the Chairman and on the second by Mr. E. H. Harman, Deputy Chairman, four papers, and 'Question Time,' followed on the evening of May 2 by a dinner and dance attended by nearly 250 guests. At the opening session a civic welcome was extended to the Board and its staff by Mr. G. F. Swaby, J.P., Chairman of the Skegness Urban District Council.

The Chairman, in his opening address, said much had been accomplished in the first three years as the result of solid hard work and sustained effort, but further progress was needed before they could be satisfied that their operational efficiency had reached the required standard and that the organisation was capable of rendering to consumers the high degree of service they had a right to expect. Reviewing the events of the past year, Mr. Smith said costs beyond the control of the Board had risen by £3 mill. since vesting day, against which the Board had effected economies at the rate of over £600,000 a year, the net increase of uncontrollable costs having resulted in the repeated and regrettable necessity to increase the price of gas.

Small individual economies could result in substantial savings; each 1% economy in the use of coke to producers, water gas plants and steam boilers combined would save 3,700 tons of coke a year and an average increase of one therm per ton of coal carbonised would save 22,000 tons of coal a year on the basis of 74 therms per ton. Substantial economies had been made in many places through improved technical efficiency but there was room for improvement, and he could not stress too strongly the need for constant attention to effective retort house control, the efficient operation of water gas plants and steam boilers; in fact to all operational processes.

Steel Shortage

Serious steel shortages had resulted in the deferment of projects for new carbonising plant totalling 17 mill. cu.ft. per day and the delay of holder projects representing over 20 mill. cu.ft. of storage. It was essential to clear accumulations of scrap iron and steel without delay and to ensure that such materials were cleared regularly. Restrictions on promotional publicity must be countered by improved service to consumers.

Mr. Smith recalled that last year he spoke of the necessity for active co-operation between all sections of the organisation and particularly between accountants and engineers, and was now pleased to observe that distinct progress had been made. Such co-operation was vital for the successful administration of the organisation. In regard to industrial relations the Board had established with the majority of the trade union representatives a basis of mutual trust. It would be a mistake to imagine that mutual trust meant no disagreement; it certainly did not. One satisfactory result of joint negotiations during the year was the setting up of 37 joint consultative committees which, given a spirit of active co-operation, would serve a useful purpose towards the further establishment of improved relations between employees and management.

The Chairman went on to pay tribute to Mr. H. F. H. Jones, his predecessor in the chair and now Deputy Chairman of the Gas Council, and to welcome Mr. E. H. Harman as Deputy Chairman of the Board. He also spoke of the appointment of Mr. C. C. Wood to succeed Mr. Harman at Sheffield, and the more recent appointments to which we make separate reference in our 'Personal' column this week. Channelling of administration direct from divisional to group level reduced delays to a minimum, simplified control, and considerably lessened the amount of 'paper work'; it also paved the way to increased delegation of responsibility. In the earlier days of the Board's short history the sub-divisional organisations performed a very necessary function which they still continued to perform in the remaining cases; but as the channels of administration had become established the function of that middle stratum had become less necessary.

Having spoken on the essential qualities for management, Mr. Smith said that within the East Midlands area there was plenty of scope for promotion for those who had proved their worth by example and by their personal records of service; by the state of their works; by their records of production efficiency and of distribution practices; by organising ability and the ability to get the best out of their employees; and he could give no better examples than those which had recently taken place wherein Board policy to promote from within, provided that the quality of the existing personnel was adequate to undertake greater responsibility, was so effectively illustrated.

'Public Money'

Mr. E. H. Harman, Deputy Chairman, in opening the proceedings on the second day, reviewed at length the effects of the change in financial structure of the undertakings vested in the Board. It had, he said, become almost fashionable for members of the public to talk of the funds of the nationalised gas industry, whether revenue or capital, as being public money. There could be little doubt that both the Government and local authorities handled public money, but the Gas Board was a trading concern. In everything they touched they were a competitive business, and at every point of their business the consumer had an alternative. The man in the street was not compelled to buy their products nor take advantage of their service, and he was not compelled to contribute to the cost of their service if he did not use it. The gas industry's money was not public money, therefore, in the sense in which the words were properly used.

The Friday sessions were attended by Mr. H. F. H. Jones (who acknowledged the tribute paid to him by the Chairman and congratulated Mr. Smith on his appointment, Mr. G. le B. Diamond (Chairman of the West Midlands Gas Board), Mr. J. S. Smith, (Assistant Secretary, Ministry of Fuel and Power), and Mr. F. G. Brewer (Secretary, Gas Council).

Papers were presented by Mr. F. Dickinson, Industrial Gas Officer, Sheffield and Rotherham Division, on 'Some Aspects of Industrial Gas Supply and Utilisation'; Mr. R. Thompson, Deputy Chief Accountant, on 'The Interpretation of Financial Accounts for Management Purposes'; Mr. J. W. Wilson, Deputy Mains Engineer, Notts and Derby Division, on 'Distribution Planning for Small Undertakings'; and Mr. Bernard Clarke, M.B.E., General Manager, Lincolnshire Division, on 'Organisation and Grouping Within Lincolnshire.' Before 'Question Time' on the Friday afternoon two films were shown—one on 'Coal to Gas,' which had earned for the Skegness Photographic and Ciné Society the London Film Production gold medal for the most outstanding film entered by any amateur ciné club, and the other a C.O.I. civil defence recruiting film, 'Waking Point.'

Dinner and Dance

The conference programme ended with a dinner and dance in the ballroom of the Imperial Cafe on the Friday evening, May 2.

Mr. Sydney Smith, Chairman of the Board, who presided, proposed the toast of the Urban District Council of Skegness. The Council, he said, was to be congratulated on its go-ahead policy which had resulted in the population being increased by six times during that period, to a normal figure of about 12,600 and a summer-time population of anything up to 70,000. Mr. I. M. Cule, the Clerk of the Council, had told him that the Council's water undertaking was in such a flourishing condition that it had recently been able to reduce its charges for water supply, despite rising costs. That showed what could be done when one's raw material fell from the clouds like manna from heaven, free of all costs, including transport charges. He wished the Gas Board was in the same happy position. The Board regretted the necessity repeatedly to have to increase the price of gas in order to recover

increases in basic operating costs over which it had no possible control.

Mr. G. F. SWABY, J.P., Chairman of the Skegness U.D.C., responding to the toast, said how pleased he was that they had selected Skegness for their conference for the third year in succession.

Non-Indigenous Constituents

Mr. E. H. HARMAN, Deputy Chairman of the Board, proposed the toast of the visitors, to whom, he said, they owed much. Without them a gathering of the indigenous constituents of the Board would be introspective and dull; with them, they rose to heights they could not otherwise attain, and they rejoiced that they graced their tables. First among the guests he mentioned the former Chairman, Mr. Henry Jones, now Deputy Chairman of the Gas Council. Those who had worked with Mr. Jones since they were nationalised realised that it was in the very nature of things that he would not always be with them. They knew his appointment would mean the greatest good for the greatest number, and for that reason they were glad. But his going had left a grievous gap and he was sorely missed. They hoped he would never have to miss one of these dinners.

The solitary representative of the Ministry of Fuel and Power from London was Mr. J. S. Smith. He alone from the Ministry had dared to face the East Midlands Gas Board within three months of purloining the Chairman. Another welcome guest was Mr. G. le B. Diamond, Chairman of the West Midlands Gas Board, with Mrs. Diamond. It could only be a matter of time before the East and West Midlands became known as the heavenly twins. The Chairmen of the two Boards sat together at Gas Council meetings, and the Deputy Chairmen at coke meetings. They took in one another's coke washing at 6d. a ton. They had in the West Midlands a very good neighbour, and in Mr. Diamond a good friend and companion. Perhaps next year they could have Mr. Alex Lee as well—he missed him sadly.

They were glad to see Mr. F. G. Brewer, the genial Secretary of the Gas Council; for Mr. John Mould, Deputy Chairman of the East Midlands Electricity Board, and Mrs. Mould they had a special greeting. Mr. P. H. De Keyser, Secretary of that Board, and Mrs. De Keyser were also welcomed. Publicly, Mr. Mould and himself were mortal enemies, but this was a private party, and privately they were very good friends.

Other guests included Mr. W. B. Wells, Regional Director of the Ministry of Fuel and Power at Leeds; Mr. H. R. F. Hemmings, Area Gas Examiner; Mr. Swaby, Chairman of the Skegness Council, and Mrs. Church, Mr. I. M. Cule, Clerk to the Skegness Council, and Mrs. Cule; Colonel and Mrs. Kennington; Alderman Mrs. Hodson, Deputy Chairman of the Consultative Council and Mayor of Doncaster; Councillor W. Albans, Chairman of the Lincolnshire Divisional Committee; Councillor W. Charles, Chairman of the Leicester and Northants Divisional Committee; Councillor H. C. Martin, Chairman of the Notts and Derby Divisional Committee, and Mrs. Martin; Alderman A. Smith, Chairman of the Sheffield and Rotherham Divisional Committee, and Mrs. Smith; and Councillor A. Denham, member of the Lincolnshire Divisional Committee; the gas Press; members of the Joint Staff Council and the Joint Industrial Council; and the ladies.

Regrets for absence had been received from Mr. Geoffrey Lloyd, Minister of Fuel and Power, Mr. L. W. Joynson Hicks, Parliamentary Secretary; Sir Donald Fergusson, Permanent Secretary; Colonel H. C. Smith, Chairman of the Gas Council; Sir Edward Herbert, Board Member, and Lady Herbert; Mr. R. N. Quirk, Under Secretary, Gas Division, Ministry of Fuel and Power; and many others.

Mr. JOHN MOULD, Deputy Chairman, East Midlands Electricity Board, who responded for the guests, said those engaged in the electricity industry were interested in what the gas industry was doing, and he hoped that the officials and staff of the Gas Board were in turn interested in what the Electricity Board was doing.

The Electricity Board felt that fair competition was a thing very much to be desired. They felt that the Gas Board had, by its competition in the East Midlands, kept them on their toes, and they flattered themselves that as a result of their own competition they had sharpened up the Gas Board occasionally. Nationalised industries at present came in for criticism from all sorts of quarters; so far as the East Midlands area was concerned, both gas and electricity were doing their best.

Mr. HENRY F. H. JONES, Deputy Chairman of the Gas Council, recalled that in the period before vesting day, after it had become known that he was Chairman Designate of the East Midlands Gas Board, on visiting the works of an undertaking of which he was then a Director, a not very young employee remarked to him that whatever happened in the future they would feel they had a sort of father in him. He was very glad to be at Skegness again, and he claimed the privilege of proposing the health of the Chairman and Mrs. Smith.

Mr. SYDNEY SMITH briefly acknowledged the toast.

Gas Show at Oban

AN exhibition of interest to householders and proprietors of catering establishments and hotels, organised by the local division of the Scottish Gas Board, was opened on April 29 in the Argyllshire Gathering Halls at Oban. All kinds of gas appliances were on show and included a wide range of cookers from the tiny two-burner and household cooker to the large cookers for restaurants and hotels. There were various water heating appliances, gas fires of modern style, gas convector types of heaters, and panel heating for hotels or large buildings.

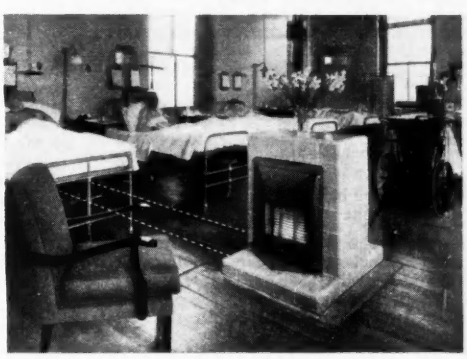
A feature of the exhibition was the model kitchen, housed in a lesser room and which contained the latest equipment. Cooking demonstrations took place daily. Mr. A. MacInnes, Sales Superintendent of the Dumbarton group, was in attendance, as well as representatives of the various manufacturing firms whose equipment was on show, which included the well-known Main range of appliances.

A side of the exhibition of special interest to people from rural areas was the show of Calor gas catering and domestic appliances.

Hospital Gas Fires

AN interesting experimental gas fire installation has recently been completed by the Public Services Section of the North Thames Gas Board, at the Metropolitan Hospital, Kingsland Road, London, E.8.

Gas fires have been installed in pairs in central pylons in two of the wards at the hospital, replacing old coal fires. The gas fire flues are 'boxed' within pylons, and trunked into existing flues which are below the floor, and which extend in submerged troughs from the base of the pylons to the external flue stacks, rising vertically on the face of the building. No special extraction methods are employed as the pull on the external stacks is quite sufficient.



It is estimated that there are more than 300 of these coal fire installations in everyday use in hospitals in the Central London area and it is hoped that this experimental installation, which is proving most satisfactory, will lead to their gradual replacement by similar gas fire installations.

It is expected that the hospital pattern fire guard shown surrounding the gas fire will shortly be replaced by a more conventional gas fire pattern. Incidentally, in the new wing of the Metropolitan Hospital, all the central heating and hot water services are supplied by two G.B.7 gas-fired boilers, with calorifiers.

Food, Health, and Hygiene

Annual Conference of Women's Gas Federation

THE Women's Gas Federation held its annual conference at Stratford-on-Avon from April 22 to 25. A heavy programme had been arranged, the addresses and discussions centring on the subjects of food, health, and hygiene, with the part which gas plays providing the dominant note.

The conference opened on April 22 with a civic reception, and at the first business session the following morning there was a civic welcome by the Mayor, who wished the conference every success and expressed his pleasure at the presence of Mr. G. le B. Diamond, C.B.E., Chairman of the West Midlands Gas Board. Miss K. M. Halpin, O.B.E., President of the Federation, was in the chair. Nearly 200 delegates were present from England, Scotland, and Wales, and 50 branches of the Federation were represented.

Mr. G. le B. Diamond, C.B.E., welcomes the delegates at the opening session of the Women's Gas Federation. On his right is Miss K. M. Halpin, O.B.E., President of the Federation.

Miss HALPIN stated that the past year had been for the W.G.F. one of firm consolidation and a prelude to advancement in the years to come. The National Cookery Competition, with its 40,000 entries, had proved an unqualified success, and the basic outlook of the Federation was one of 'forward seeking.'

Mr. G. LE B. DIAMOND, in an address of welcome, said it gave him particular pleasure in that Miss O. L. Humphries, Executive Chairman of the Federation, was Area Home Adviser to the West Midlands Gas Board.

Miss HALPIN then introduced Dr. R. N. BEATTIE, a Principal Medical Officer of the Ministry of Health, who gave a talk on 'Food Hygiene in the Home,' outlining the methods of preventing food poisoning, emphasising particularly personal hygiene and careful storage of food. Discussion followed and a vote of thanks to the speaker was proposed by Miss HUMPHRIES.

Mrs. ERIC EVANS, J.P., Chairman of the Cardiff Branch of the Federation, took the chair at the second session on April 23, when Mrs. JOAN ROBINS spoke on 'safe food' and the necessary measures to ensure that, in fact, food was safe. 'Hygiene,' she remarked, 'is learned in the home, and housewives must recognise their responsibilities by seeing that their families have learned this important principle in the home; it should not be left to the teacher at school.' Discussion ensued and Mrs. DOUGLAS THOMSOM voiced the thanks of the delegates.

'Hygiene in Practice in the Kitchen' was the first topic to be discussed on the second day of the conference. Mrs. D. M. BOWEN, Chairman of the Newark Branch, presided, and the talk was given by Mr. W. A. G. Bradman, who demonstrated how the housewife's lot could be eased by the use of new materials in the kitchen—among them sawdust board, laminated plastics, and poly-vinyl chloride. In a vote of thanks, Mrs. EVERSHED described Mr. Bradman as the 'housewife's dream.'

The other item of the session was a talk by Mr. E. N. WAKELIN, Chief Sanitary Inspector, Birmingham Health Department, whose subject was food hygiene as applied to shops. He pointed to the ways in which the shopkeeper could help to protect food from contamination, stressing the need for an ample supply of hot water and urging that housewives should discriminate in their choice of shops, shunning those where cleanliness was ignored.

Miss M. D. HENDERSON (Airdrie) proposed a vote of thanks to Mr. Wakelin, and the conference session was concluded by an omnibus vote of thanks proposed by Miss HUMPHRIES, who mentioned specially the work of Miss D. W. Pidsley, Miss M. Godby, Miss M. F. Flack, and Miss B. Hulme.

Annual General Meeting

The annual general meeting of the Federation took place on April 24, Miss HALPIN presiding.

Colonel H. C. SMITH, C.B.E., Chairman of the Gas Council, referring to the price of gas, said that, though it had been increased several times since the war, it would have increased more had it not been for the organisation which had enabled savings which, indeed, would have been greater if the gas industry could have had the steel required to build new gasworks and connect up existing works. At present only 50% of the steel really required to carry out plans to improve gas supply was available. Colonel Smith concluded his remarks by thanking members of the W.G.F. for the help they were giving to the Gas Council and the area boards.

Mr. DIAMOND, in a short speech, commented on the fact that there were now over 70 branches of the Federation and that the number was increasing. He stressed that the members of the W.G.F. provided an important link with other women's organisations to which they belonged, for there were many occasions when members were able to use their knowledge of gas to the great advantage of the gas industry when subjects of interest to the industry were discussed. They in the gas industry assisted the home maker by their home service organisations and by improving gas appliances, but there might be agreement with what Mr. Dwight Fiske said a day or two previously: 'Of all the labour-saving devices ever invented for women, none has been so popular as a devoted man.'

Dame VERA LAUGHTON MATHEWS, Adviser to the Gas Council on Woman's Affairs, spoke of the Federation's idea of holding an 'International Kitchen,' the idea being to show how traditional national dishes of other lands could be prepared suitably and in a palatable way with ingredients obtainable by housewives in this country. The British team was to be chosen from the home service advisers in the gas industry. The date decided on was November 4 and the exhibition was to be held in London at the Royal Festival Hall.

The final talk—on 'Health in the Home'—was given by Professor Winifred Cullis, C.B.E., and a vote of thanks proposed by Mrs. G. ABBOTT concluded the meeting.

INSTITUTION OF GAS ENGINEERS

Manchester and District Section

THE Second Annual General Meeting of the Manchester and District Section of the Institution of Gas Engineers, was held at the Grand Hotel, Manchester, on April 25, the retiring Chairman, Mr. Thos. HAWORTH, in the chair.

The Senior Vice-Chairman, Mr. A. McDonald, was installed as Chairman for the 1952-53 session; and gave an address on 'Humanics in the Gas Industry.' This will be published subsequently in the *Journal*.

At the lunch which preceded the meeting, the guests included the chairman of the Wales and Monmouthshire Section of the Institution, Mr. A. Pickard; Mr. D. P. Welman, Chairman of the North Western Gas Board; and Dr. R. S. Edwards, Chairman of the North Eastern Gas Board, who invited members of the District Section to visit the York gas undertaking on July 4, which happens to be the new Chairman's birthday.

At the meeting, Mr. Haworth, who presided, was supported by the Senior Vice-Chairman, Mr. McDonald; Junior Vice-Chairman, Mr. A. K. Collinge (Preston); Mr. H. Johnston (the new Junior Vice-Chairman); Mr. J. H. Clegg (Hon. Treasurer); Mr. A. H. Nicholson (Hon. Secretary); and Dr. Edwards.

Among letters of apology was one from Mr. G. S. Frith, J.P. in which he expressed his pleasure that Mr. Haworth would be presented with his old Medal.

Institution Membership

The SECRETARY reported the receipt of a letter from Dr. Braunholtz drawing attention to By-law 18 of the Institution: 'Any member, associate member, or associate who shall satisfy the Council that he has retired from his profession, business, or employment, and that at the date of the application he is not less than 60 years of age, and has for not less than 20 years been a member, associate member, or associate of the Institution, or of the previous Association, shall on making application to the Council be entitled as from January 1 following such application to have his annual subscription reduced by one half; but if he shall at any time thereafter practise for reward or carry on any business, or accept any employment for reward such reduction in subscription shall cease to have effect from the first day of January preceding the date on which he shall first practise the profession, carry on such business, or enter on such employment.' Some district sections had a similar arrangement whereby members in retirement or resident abroad paid subscriptions at half the usual rate, and it had been suggested that sections which had not done so might care to consider introducing it, and, if thought fit, submit a proposal to the Institution Council.

Continuing, the Secretary said the matter was considered by the Management Committee and it was decided to tell Dr. Braunholtz they would like to have the same facility for their members. The application was submitted to the Institution Council and was approved.

The annual report and accounts which had previously been circulated were then formally adopted.

Annual Report

The Committee, reporting upon the work of the Section during the last 12 months, recorded with much regret the death of Mr. R. N. Webb, who was President of the former Manchester Association in 1937. Mr. Webb was always a keen and staunch member, and retained his interest in their affairs right to the end. During the year they had welcomed 32 new members. They had lost by resignation eight of their old friends, and at the present time their active membership was 183.

New Officers

It was recalled that the ballot for officers for the 1952-53 session had resulted as follows:

Chairman—Alex. McDonald.
Senior Vice-Chairman—A. K. Collinge.
Junior Vice-Chairman—H. Johnston.
Committee (three vacancies)—W. S. Hubbard, C. A. Newham, T. D. Olver.

The report continued that a President's Medal had been presented to the Section for the second successive year. This time the gift came from Mr. G. S. Frith, J.P., who was President in 1924 and previously Secretary from 1914 to 1922. They thanked Mr. Frith for his very generous action, and wished him many years of happy retirement. The Medal suitably inscribed would be presented to Mr. Haworth at the conclusion of his year of office.

It was explained that the Management Committee, had decided not to accept Associates of the Institution as being eligible for membership of the Section.

The CHAIRMAN (Mr. T. Haworth), reporting as District Member of the Institution Council, spoke of the Institution Benevolent Fund, mentioning that with a total membership of 168, the Section had 128 of them subscribing, which was 76.2%. It was with some pride that he learnt at the last Institution Council that their Section headed the list for the percentage of members who subscribed. He hoped that next year the Section would show 100% subscribers.

The following recommendations of the Management Committee were then respectively put to the meeting, and adopted in each case, without opposition:

That a donation of 35 guineas be contributed to the Benevolent Fund of the Institution of Gas Engineers.

That Mr. Alex McDonald be appointed the Manchester and District Section's District Member on the Council of the Institution of Gas Engineers for the year 1952-53.

That Mr. John Grayston, G.M., and Mr. A. Cole be appointed representatives of the Section on the Councils of the Manchester and District and Yorkshire Junior Associations respectively.

That Messrs. J. H. Clegg, J. Castle, W. B. Harrison, and H. H. Thomas be appointed representatives of the Manchester and District Section on the Lancashire District Gas Education Committee.

That Messrs. N. G. Appleyard, H. Johnston, J. G. Tilley, and J. M. McLusky be appointed representatives of the Manchester and District Section on the Yorkshire District Gas Education Committee.

Induction of New Chairman

Mr. HAWORTH then inducted Mr. Alex McDonald as Chairman for the forthcoming session. Many of them had known Mr. McDonald for a long time. His ability, energy, and enthusiasm were recognised long before nationalisation and he had served the Association and the Section conscientiously. It was with great pleasure that he invested Mr. McDonald with the President's Badge as symbol of his office.

Responding, Mr. MCDONALD said he undertook the task which they have placed in his care with a deep sense of responsibility.

Mr. McDonald then presented the Past President's Badge to Mr. Haworth, and observed that when an official had served an Association for a number of years as Hon. Secretary, as Junior, and then Senior, Vice-Chairman, and finally as Chairman, he was entitled to feel that he had performed his duty by the Association. But when he had done that with a good deal of distinction, then he was entitled to feel some gratification in a job well done. Mr. Haworth was in that position that day. He had served that Section of the Institution and the former Association in all those capacities over a period of nine years.

Mr. HAWORTH expressed thanks to his colleagues for the support they had given him in the last nine years in various offices, and for the enjoyment he had experienced in serving the Association and the Section.

Dr. R. S. Edwards said he could not claim to have known Mr. McDonald for a long time; but had worked intimately with him over the last three years, and it had never been his privilege to have a more loyal, more friendly, more co-operative, and more devoted colleague than Mr. McDonald. He was sure that in his colleague of the North Eastern Gas Board the Section was going to have one who in every way would fully maintain all its standards.

Dr. Edwards then, on behalf of the North Eastern Gas Board, extended an invitation to the Section to visit York on July 4.

(*Concluded on next page*)

INSTITUTION OF GAS ENGINEERS

Chairman's Address

Mr. McDONALD then gave his Address as Chairman.

Mr. A. K. COLLINGE (Senior Vice-Chairman) proposed a vote of thanks to Mr. McDonald. Their Chairman, he said, had stated that employees had become partners in the industry—with all that that involved. One of their greatest difficulties in the application of 'Humanics' was the rapid labour change-over today as compared with pre-war days, which made the realisation of this partnership and its obligations difficult to bring about. Over the last three years at the Preston undertaking approximately one-quarter of the total manpower had left and been replaced every year—a very serious position. It was very fortunate that they had a 'leavening' of old, well-tried, regular employees to counteract this change-over, this floating population. As an example, the night previously he presented 100 long-service certificates to people with over 25 years' service; 14 of them had completed 40 years. This would indicate that they have retained this 'leavening' of well-tried, loyal, and experienced servants.

But their only real answer to the problem from the long-term point of view was provided by the Chairman's Address. Again quoting Preston, 84% of the manual workers were not craftsmen. They could only reach them through the foremen, and he agreed wholeheartedly with Mr. McDonald's remarks about this class of employee. The North Eastern Gas Board had been quick to recognise the necessity for adequate instructors for job relations and methods and had had them trained for conducting courses. Mr. McDonald had presented them with a clear and comprehensive picture of the steps taken by his Board in all aspects of education, training, and welfare, which could not fail to serve as an example to other boards.

Mr. H. JOHNSTON (Chief Engineer, North Eastern Gas Board, Junior Vice-Chairman), seconded the vote and Mr. McDONALD responded.

Mr. A. HARRISON (Blackburn) proposed a vote of thanks to the retiring officers and members of the Management Committee, and expressed the gratitude of the members for the untiring service so ungrudgingly given.

Mr. HAWORTH responded on behalf of his colleagues.

Midland Section

MR. J. E. WAKEFORD, M.B.E. (General Manager, Birmingham Division, West Midlands Gas Board), was installed as the new Chairman of the Midland Section of the Institution of Gas Engineers at the annual meeting of the Association, held at the Queen's Hotel, Birmingham, on April 25. Mr. Alexander Tran, the retiring Chairman, performed this ceremony after various nominations for the different offices had been made by the Management Committee and confirmed.

Mr. TRAN said it gave him much pleasure to do so. Mr. Wakeford was well known to all of them, and it was with great satisfaction to him (the speaker) that he would be handing over the chain and medal of office to a man who would fill the presiding chair with credit and carry on the traditions of the old Association and the Section.

Mr. WAKEFORD first of all took the opportunity of expressing on behalf of the Midland Section their very warm appreciation of the able manner in which Mr. Tran had carried out his duties. It would certainly be his endeavour to emulate Mr. Tran's example. At the invitation of the Management Committee, Mr. Tran had chosen as a memento of his year of office a small salver, which was not available just yet, and he would in the meantime ask him to accept as a token of their good will the presentation of a Past-President's Medal with their best wishes.

In acknowledgment, Mr. Tran said he had enjoyed his year of office, and much of this pleasure was derived from the splendid support of the members and the very able Management Committee, and last but not least from their Secretary, Mr. Corrigan.

It was announced that recent new members were Messrs. A. Robert Shaw (Drakes, Ltd.), R. W. Foulds and G. H. Potter (Birmingham), W. R. Branson (Leicester), S. M. Milbourne (Wellington), P. J. Bunker (Long Eaton), and F. Lake (Radiation Ltd.), and they were welcomed by the chairman. New members now accepted were Messrs. J. W. Rawbone, S. C. Crathorn, C. S. Davies, and H. L. Tolley, Education Officer to the West Midlands Gas Board.

The annual report and statement of accounts were approved, the latter having been audited by Messrs. A. Facer and S. C. Bentley. There was a credit balance on the year's working in the general fund of £61. The report gave the membership as 196, and the Committee acknowledged the encouragement and assistance received since the inauguration of the Section from chairmen and members of the West Midlands, East Midlands, and the Southern Gas Boards. Two personal references were also made. One was to Mr. S. K. Hawthorn (Birmingham Divisional Engineer) on being awarded the Institution Silver Medal for his paper on 'Making the Best Use of Existing Gas Making Plant and Planning Extensions with Maximum Economy.' The other was the annual prize of the Section, awarded by Sir Ernest Smith, C.B.E., to Mr. R. Kimble, of the Midland Junior Gas Association, for his paper on 'Organisation and Opportunities in New Building Work.'

New Officers

The following were elected to office:

Chairman: J. E. Wakeford.

Immediate Past Chairman: A. Tran.

Senior Vice-Chairman: W. Macnaughten.

Junior Vice-Chairman: C. C. Wood.

Hon. Secretary: J. Corrigan.

Hon. Treasurer: J. H. Wainwright.

Auditors: F. L. Atkin and C. H. Woodfine.

Ordinary Members of Management Committee: For 1952-54, D. K. Green; for 1952-55, A. Facer, S. C. Bentley, and F. J. Bengough.

District Member of the Institution Council for 1952-53: J. E. Wakeford.

As an ordinary member of the Council for 1952-55, Mr. A. Tran was nominated by the Management Committee and appointed.

Giving the report of the Midland District Education Committee, Mr. H. R. HEMS said they had met twice during the year, and the Committee was represented either by its Chairman or the Hon. Secretary at each of the four meetings of the Institution's Education Committee. Dealing with the constitution and functions of district education committees, he said a matter of major discussion by the Institution Committee had been the question whether district education committees should continue their activities, and, if so, what their constitution and functions should be. Having given serious consideration to this matter, the Midland Committee forwarded their views to the Gas Education Committee in London, and he could report that the Council of the Institution had advised that the district education committees should continue their work. The committees had been asked to consider what reconstitution was necessary. Going into the matter in some detail, Mr. Hems pointed out that the Midland District Committee was somewhat awkwardly placed, because its territory and that of the Midland Junior Gas Association (from which bodies the membership of the Committee was mainly drawn) covered the territories of several area gas boards, including the whole of the West Midlands Board area, but only portions of the East Midlands, the Southern, and the South Western area boards. While it was the wish of the Midland Committee not to impinge on the educational work which had become the duty of officers and area boards, it was felt that it would be of advantage to all concerned that suitable liaison should exist between the Midland Committee and the appropriate area boards in the discharge of functions remaining to the Midland District Committee.

Mr. Hems added that the Birmingham College of Technology had offered to initiate a full-time course in gas engineering and had submitted proposals to the Institution of Gas Engineers. In view of the successes of the full-time intensive courses, the Committee considered that there was much to commend this pro-

ject, and he hoped that final approval would be given to it by the Institution of Gas Engineers and the Institution of Civil Engineers.

It was agreed that a donation of 50 guineas should be made to the Benevolent Fund of the Institution of Gas Engineers; and during the meeting a 'collection' realised £17 15s.

Mr. G. E. CURRIER, O.B.E. (Senior Vice-President of the Institution of Gas Engineers), thanked the Section for the generous contribution made, and said he would like to pay tribute to the valuable work done by Mr. C. F. W. Rendle for a very long period on behalf of the Benevolent Fund.

Mr. WAKEFORD then delivered his Chairman's Address, which will be published subsequently in the *Journal*.

A vote of thanks to Mr. Wakeford was proposed by Mr. W. MACNAUGHTON and seconded by Mr. C. C. WOOD.

Luncheon Speeches

Prior to the meeting luncheon was held at the Queens Hotel, Birmingham, at the invitation of the Chairman and members of the West Midlands Gas Board.

The Chair was taken by Mr. Alexander Tran, the outgoing Chairman of the Section, and there was a large attendance of members.

Mr. J. E. WAKEFORD proposed the toast of the West Midlands Gas Board. Thanking Mr. Diamond and the Board for their hospitality, he said the fact that they supported the Institution as a whole and the Midland Section in particular was very much appreciated.

He was thinking the other day of what was the greatest change nationalisation of their industry had brought to the gas engineer and he decided without any hesitation that, while in the past the municipal gas committee or the company board was responsible for policy, such policy, to a great extent, emanated from and was the recommendation of the gas engineer in charge of the individual undertaking. This lack of playing a part in guiding policy was, he thought, what the engineer missed most today. 'Policy,' he said, 'is now determined by the Board, and while I must admit that at times we may not agree with every directive that is issued, yet our Chairman, Deputy Chairman, and members may be assured that such policy will be carried out faithfully and to the best of our ability.'

Mr. G. LE B. DIAMOND, C.B.E. (Chairman of the West Midlands Gas Board), in responding, said he was happy to congratulate Mr. Wakeford on his election to the Chairmanship of the Section. Mr. Wakeford was born into engineering and served his articles in gas engineering at Stockton-on-Tees. After some further experience in Yorkshire he travelled south to Plymouth and then again to the North-West and to Warrington, where he was Engineer and Manager. In 1945 he moved to Coventry in a similar capacity. On nationalisation the Board appointed him to the important position of Divisional Manager at Birmingham and he now held the title of Divisional General Manager. They would thus see, to use a Yorkshire expression, that Mr. Wakeford had learned the gentle art of flitting. They were confident that Mr. Wakeford would worthily uphold the tradition at Birmingham where the industry had for so many years a succession of outstanding leaders.

There could be no doubt that since nationalisation much steady progress had been made in the unification of the Board's activities and towards increased efficiency. The Board was conscious of the fine team spirit that had been shown by the engineers, the accountants, and other senior staff in loyally supporting the policy of the Board, sometimes under conditions which were both tedious and frustrating. Had it not been for all the inhibitions of the day he was quite sure they would have made even further progress and have brought to fruition some of the integration schemes which would result in considerable savings. It was particularly unfortunate that nationalisation should have coincided with one of the worst periods of inflation in their history. In the case of the West Midlands Board the additional costs which had fallen upon them since vesting day, and which were due entirely to outside influence, and not to internal activities, amounted to very nearly £4 mill. With carbonising results that would bear comparison with any board in the country and an extremely low capital indebtedness, there was no margin to meet such a formidable rise in prices and materials, and consequently it had had to be passed on to the consumer in successive increases in the price of gas. There were very few, if any, individuals in operational control of the gas industry who were new to the job. The majority had had a lifetime's experience and were devoted to the industry to which they gave such excellent service. Not one of them would willingly see the price of gas increased if any action of theirs could prevent it. They were, however, all powerless in the face of current circumstances.

Freedom for Discussion

He must say a word about the Midland Section of the Institution of Gas Engineers and about their own engineers in particular. There was much misgiving before nationalisation took place on the possible position and function of the professional institutions, but he felt that the fears had been dispelled and both the Gas Council and the area boards, as might be expected of good employers, had recognised the importance of the professional institutions and had done all in their power to foster and support them. It was of immense importance that there should be freedom of discussion on technical matters as well as complete freedom in the sphere of conditions of service, which were appropriately discussed by other bodies.

They were sometimes asked what future was there for the engineer in the nationalised gas industry and the answer must be that the prospect for the young engineer had never been brighter. The gas industry in its development appeared to have moved in cycles of from 30 to 40 years. They were nearing the end of one such cycle, but the next was far too indistinct to define in technical terms. It might be leading to complete gasification by revolutionary methods, but one thing was certain—namely, a higher technical competence would be required by the gas engineer in the future. The Board would continue to offer inducements to those who wished to take up engineering as a career and were about to enter industry, to the young graduate who was just leaving the university, and to a few skilled engineers from other parts of the country who might be successful in competitive interview.

The transition period was not yet over, but when it ended he expected to find an integrated, co-ordinated engineering organisation in each of the area boards, with administrative and commercial matters divorced from the technical side in all but the medium and smaller sized undertakings which would require a specialised type of individual.

A Strong Position

Mr. G. E. CURRIER proposing the toast of the Midland Section, congratulated Mr. Wakeford on the position he was taking up and on being chosen to lead the Midland team which had so distinguished itself. The Section, he understood, was in a strong position. Membership numbered 200 and covered an area of 11 counties—and there were 400 members in the Junior Association. He had been interested to look back over the years and see the number of Midlanders who had occupied the Presidency of the Institution. There was Dr. H. Hartley in 1947, and he could not forget his effort which resulted in the new Institution Headquarters in Grosvenor Crescent. In 1948 there was Mr. George Pearson, so well known in Birmingham, in 1927 Mr. John Wilkinson, of Nottingham, in 1928, Sir John Ferguson Bell, in 1912 Mr. R. G. Shadbolt, and in 1907 Mr. Charles Hunt. These were stalwarts who came from the Midlands and directed affairs with every distinction.

Mr. TRAN responded and said how much they appreciated the visit of Mr. Currier, who was a Midland 'old boy.' They were very proud of the progress he had made since he left Birmingham.

Public Lighting Engineers

THE annual conference of the Association of Public Lighting Engineers is to be held at Harrogate from September 16 to 19 inclusive, when a large attendance of members and delegates appointed by local authorities and electricity and gas boards throughout the British Isles is anticipated. Notifications of the attendance of members and delegates from overseas are also already being received.

An interesting programme has been arranged and papers dealing with various aspects of matters relating to street lighting will be given at the conference sessions. Of added interest this year will be a paper to be given on street lighting in the United States by Dr. A. F. Dickerson, General Manager, Lighting and Rectifier Dept., General Electric Company, U.S.A.

In a specially erected marquee near the conference hall (the Royal Hall) members and delegates will have the opportunity of inspecting an exhibition of street lighting and equipment.

THE BRITISH INDUSTRIES FAIR

Review of Gas and Allied Exhibits

ONE of the most valuable achievements of the Gas Council has been its function of bringing together what one might term 'interested parties' in the industry and demonstrating that their unity results in strength. This was amply demonstrated at the 1951 British Industries Fair when that excellent custom of holding an industrial gas conference was revived, and when an effective gas section was built up at Castle Bromwich. Again working in partnership with the Society of British Gas Industries, the first post-war gas section was evolved at the Ideal Home Exhibition. And this policy has been continued in the current B.I.F. with encouraging results. The conference is dealt with in our editorial notes; on these pages it is proposed to describe the wealth of gas interest which awaits the visitor to Castle Bromwich.

As usual the exhibits on the **Gas Council** stand (*D.641 and 540*) have been chosen with obvious care and a recognition of what is new and likely to interest the visiting industrialist. Prominent among the new appliances shown is a prototype crucible furnace specially made by the East Midlands Gas Board. This makes use of radiant burners, instead of the more usual tangential firing, with a consequent increase in pot life.

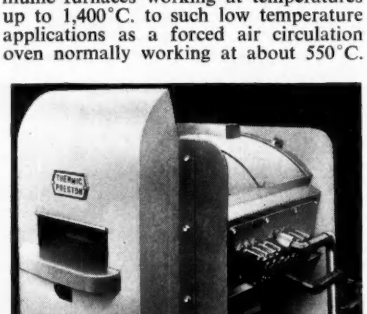
With a view to minimising or eliminating some of the difficulties normally experienced with gas-fired crucible furnaces, the new furnace has been designed at normal crucible size (60 lb. capacity), the radiant burners being arranged to heat the crucible evenly on all sides. This is intended to eliminate local concentration of heat and minimise exfoliation, which should give longer crucible life. The flue gases still retain a considerable amount of heat, some of which can be used for preheating the ingots or scrap by using larger crucibles up to the 120 lb. size and charging these to full capacity. Combustion noise has been very much reduced at all gas rates; at holding temperatures it is negligible. Also, heat losses through the furnace walls have been minimised, as most of the internal wall area is comprised of burner faces, *i.e.*, sources of heat input.

The furnace structure consists of four C.I. side plates, with a top and a bottom plate. The four burners are bolted to the side plates, appropriate refractories being required only for the base, the four corners, and above the burners. Each burner comprises four standard radiant blocks, each rated at 60 cu.ft. of gas per hour, the air being at 28 in. w.g. pressure and the gas at normal mains pressure at the inlet of the special air/gas mixing unit. The maximum gas rate is 960 cu.ft. per hour, with a standby rate of 400-500 cu.ft. per hour. From a cold start, an initial melt of 90 lb. of brass (60/40 mixture) can be poured in 45 minutes, after which a similar amount can be melted each 30 minutes when using a 120 lb. crucible fully loaded. On this basis, the gas rate varies from 4.5 to 5.5 cu.ft. of 500 C.V. gas per lb. of metal melted, dependent upon whether ingots or general scrap are fed into the crucible.

The burner faces attain a temperature of 1,400°C. which falls to red heat when a crucible is placed in the furnace and is regained as melting progresses. It is reported that after a severe three weeks' testing period, when melting general non-ferrous scrap, the burners were in first class condition. A similar unit has been satisfactorily used in powder metallurgy research testing, and from the experience gained a larger furnace is now being designed.

Adaptability of Gas

This exhibit is one of a series designed to show the adaptability of gas as a fuel suitable for heat treatment work over a great temperature range. The exhibits vary from the crucible furnace mentioned above and forge and muffle furnaces working at temperatures up to 1,400°C. to such low temperature applications as a forced air circulation oven normally working at about 550°C.



The Cyclone forge furnace (Thermic Equipment & Engineering Co., Ltd.) which is shown on the Gas Council Stand. It is especially suitable for all types of forging and re-heating, working at temperatures between 850° and 1,250°C.

Another appliance for high-temperature heat treatment is the Cyclone forge furnace (Thermic Equipment and Engineering Co., Ltd.), which, apart from its use in this country, has also been exported to Belgium where it has been installed by such firms as the Fabrique Nationale of Herstel. The furnace is designed for a particular high-grade type of forging and stamping. The method of firing is such that there is little or no flame impingement on the hearth, and a high degree of uniformity of temperature can be attained over the hearth area. A double-case screen in front of the furnace, with an air curtain, assures the maximum comfort for the operator; and the shock absorbers on which the furnace is mounted helps to increase the life of refractories. It is suitable for working at temperatures between 800°C. and 1,250°C.

Muffle Furnace

The third appliance for high-temperature heat treatment to be shown on the stand will be a muffle furnace (Selas Gas and Engineering Co., Ltd.), with a maximum working temperature of 1,250°C., designed for use with low pressure gas. Thousands of these furnaces have been supplied for production heat treatment work, for laboratory and research purposes, for experimental work and for medical, surgical and dental processes.

Among the medium temperature appliances for heat treatment, the portable cover furnace of Dowson & Mason Gas Plant Co., Ltd., is of special interest. The cover has its own lifting arrangement and a jib crane is incorporated for the handling of the material on the furnace base. It has one important advantage over other types of equipment used for the annealing of castings. Its initial cost is somewhat lower, although it is a highly efficient piece of apparatus. The reason for the reduced cost is that the normal furnace must be provided with a lift-up door with its attendant gearing and counter balance weights, and bogie furnaces which are used for the same purpose must have hand or electrically operated haulage gears.

The furnace is likely to find a ready market in foundries, both in this country and abroad. It is a type of furnace which was originally introduced just before the war in the South Wales sheet trade, but which has since been adapted for the treatment of forged steel rolls, for the annealing of steel and iron castings, for the stress relieving of welded steel parts, and for malleablising. In many instances it is taking the place of the older types of pit furnaces and for many operations it can be considered as an alternative to the bogie or car bottom furnace. The gas burners in this furnace are arranged on the two long sides of the base and are well inside the outer edge of the buckstaves, which enables them to be fitted with covers to make them totally enclosed.

Natural Draught Furnace

Among other medium temperature appliances for heat treatment to be seen on the Gas Council stand is a natural draught furnace (Incandescent Heat Co., Ltd.) suitable for annealing, reheating, normalising, tempering and carburising at temperatures between 600° and 1,000°C. Both temperature and furnace atmosphere can be varied and controlled to within fine limits.

One of the gas-filled salt bath furnaces of Brayshaw Furnaces and Tools, Ltd., is also shown in this section. It is fitted with natural draught burners and reaches a temperature of 900°C., making it especially useful for cyanide hardening.

Forced Air Furnace

The forced air circulation oven by J. L. S. Engineering Co., Ltd., can be controlled to within a few degrees and has an average gas consumption of 150 cu.ft. an hour. No products of combustion enter the working space.

Another example of the use of radiant heat is to be found in the infra red blacking dryer of Thomas De La Rue & Co., Ltd. This infra-red unit panel system consists of special cast metal panels, each heated directly by 12 neat gas flames and backed by insulation, all housed in a sheet metal case. Each burner is fitted with a tap and union, and the design permits of servicing while the unit remains in position. The system has been used to dry articles on a simple line conveyor at a rate of 9,000 per hour.

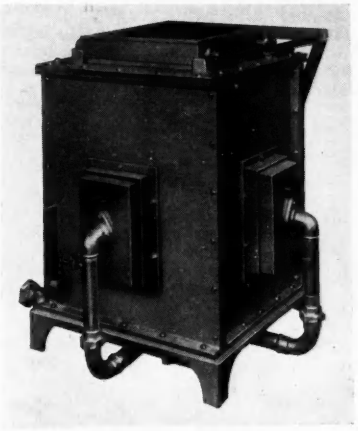
The unit on the Gas Council stand consists of four horizontal type infra red panels built over a wide mesh conveyor 11 ft. long by 2 ft. wide. The belt, manufactured by the British Wedge Wire Co., Ltd., is driven through a Barker type variable speed unit to give a ratio of 4 to 1 between maximum and minimum speeds. The oven is typical of the kind used for the stoving of small articles which are laid out in batches on trays for spraying.

Core Drying

This is one of the exhibits in the section dealing with gas-heated appliances in the foundry, where there is considerable scope for their use. Core drying, for instance, can be effected by ovens such as the drawer type (F. J. Ballard & Co., Ltd.). This is a type used in many foundries in this country, and also exported to the Continent, India and South Africa, for drying small cores where it is an advantage to have a drawer type so that each drawer can be loaded or unloaded separately and the aperture sealed when the drawer is fully open. Special features in the model on view are that the oven is fitted with flame failure devices and explosion relief panels.

Another core drying appliance is the Acme Minor continuous vertical stove (Foundry and Engineering Co., Ltd.). The model shown is due to be exported to New Zealand later. It was designed to meet the demand from malleable iron, non-ferrous and other small foundries for a stove which could bake large quantities of very small cores. It is normally installed over a pit which allows the lower portion of the conveyor to pass beneath the combustion chamber which is then at convenient height, with a loading point of between 2 ft. and 2 ft. 6 in. above floor level. The furnace, self contained within the body of the stove, is lined with refractories and fitted with burners with Aeromatic injectors. Secondary air is provided by the blowing fan. Part of this air is discharged into the firebox below the burners to dilute and carry the products of combustion into the stove towards the loading end. Air is also passed into a heater box over the top of the burners and discharged towards the descending cores for final baking and oxidation of the core binder. Average gas consumption, when fully loaded, is in the region of 600 cu.ft. an hour, and the stove can dry, for example, 15-20 cwt. of oil-sand cores in that time.

Other appliances for the foundry on show include a crucible furnace (Morgan Crucible Co., Ltd.) with a 200 lb. bale-out capacity; a mould dryer (Modern Furnaces and Stoves, Ltd.) for use where dilution of the hot air with products of combustion is possible; and foundry mould and core drying torches (Selas Gas and Engineering Co., Ltd.) for the skin drying of foundry moulds on the floor or in other positions.



The prototype crucible furnace, specially designed by the East Midlands Gas Board, shown on the Gas Council stand. This furnace is designed with radiant burners instead of tangential firing.

Glass Working Exhibit

Gas has always been regarded as the ideal fuel for the working of glass for the production of fine quality and scientific ware. A demonstration is given on the stand by G. Springham and Company. The use of a special type of burner (Chance Bros.) adapted to these intricate processes is shown. This burner is so designed that the gas supply comes on automatically when the burner is lifted for use.

Metal Spraying

A demonstration of metal spraying, involving the use of mixtures of oxygen and gas under pressure, is given on the stand by Metallisation, Ltd. This process is used for the spraying of a variety of surfaces by the wire processes. Steel coatings are slightly harder than the same quality of steel wire, due to the presence of oxide in the sprayed metal, and with high carbon steel wire, extremely hard coatings can be obtained. Other metals which can be sprayed with the 'pistol' are zinc, tin, aluminium, nickel, lead, bronze, brass, copper and cadmium. The pistol is a small machine through which a wire of the metal or alloy to be sprayed is passed at a steady speed. It feeds into the hot zone of a blow-pipe flame, surrounded by a cone of hot air. As the metal becomes molten it is atomised by the air, and the particles are driven forward on to the surface to be coated. The flame is fed with oxygen and gas under pressure.

COKE EXHIBITS

The exhibit of the Gas Council Coke Department on stand D.643 is designed to illustrate the use of automatically fired and controlled coke-burning appliances for central heating, small steam raising plants and furnaces for industrial application.

One of the most interesting exhibits is a full-scale sectioned automatic coke-burning furnace, used to supply heat at closely regulated temperatures for industrial applications up to 1,200°C., such as direct drying of a great variety of materials and process work. The furnace, which was patented by the Gas Council, is built under an agreement by the M.E.T. Furnace Construction Co.

In co-operation with the Gas Council Coke Department, the Brockhouse Heater Co., Ltd., has introduced a new design of large gravity-feed boiler which is shown in section on the stand. Clinker is formed on the sloping grate as a vitrified pad, which is removed at intervals varying from 10 to 16 hours according to the nature of the installation load. Under normal installation conditions, this boiler, designed for quantity production, maintains an average operational efficiency around 75%. The boiler is now available in sizes up to 1,800,000 B.Th.U. per hour.

This furnace was originally designed to meet the demand for an efficient and simple hopper-feed furnace for grass drying, to be capable of operation with unskilled labour and which could maintain a steady output without elaborate controls. From experience gained in this field the furnace has now been developed for application to a wide variety of processes, employing the 'direct' principle of heating or drying, in which the products of combustion, after mixing with diluting air, pass through the material to be dried or heated.

Central Heating Boiler

The Bouellat 'B' type central heating and small steam raising boiler has been introduced in collaboration with the Gas Council Coke Department and is of a novel construction in mild-steel, incorporating a very large convection heating surface. The boiler, which is designed for quantity production, is now available in a range of sizes up to outputs of 4,100,000 B.Th.U. per hour, either for hot water or low pressure steam up to 80 lb. per sq. in. When using a normal gas coke, the Bouellat Engineering Company operating efficiency figures between 75 and 80%, depending on the particular installation.

We publish now the comprehensive review of exhibitors connected with the industry which has long been associated with the *Journal*. Pressure on available space precludes anything more than a

bare outline of the exhibits, but it is hoped that this will prove of some service to readers who may be planning a visit or who, unable to attend, desire to know something of the range of equipment on show.

TRADE EXHIBITORS

Stand A. 415. **Acme Wringers, Ltd.,** need little introduction and their products little description. The well-known hand-operated domestic models are on show, together with power-operated types.

Stand D. 302. Spray guns for every finishing need from buttons to battleships is the claim of the **Aerograph Co., Ltd.** Other products include air transformers and regulators, pressure feed tanks, air compressors, exhaust fans, portable spray painting plants, air and fluid hose, automatic sprays, and air brush equipment.

Stand D. 542. Among the exhibits on the stand of the **Aeromatic Co., Ltd.,** is the interesting Aeromatic gas injector with which fuel economies up to 30% have been recorded. Other products shown include the Aerospreada, Hypact, Aerojet, Aeroflat, Aeroneat, and Permaneat burners.

Stand, Outdoor, 1336. A remarkable range of ladders, steps, and trestles is shown by the **Aluminium Ladder Co., Ltd.,** in which maximum strength is combined with minimum weight.

Stand C. 108. The lightweight refrigerator which has made a considerable hit with the public is the Astral, exhibited by the **Astral Equipment, Ltd.** The appliance weighs only 65 lb. and measures 24¼ in. × 22⅜ in. × 21¼ in.

Stand A. 600. **Autocontrol Boilers, Ltd.,** exhibit their Vertex gas-fired boilers for central heating and direct hot water supply. Of steel, they are fully automatic, complete with thermostat, flame failure device, and clock control.

Stand C. 202. **C. R. Averill, Ltd.,** demonstrate their silica graphite paints for iron and steelwork protection. Other products shown include Avarc enamel high gloss and coach finishes for industrial and decorative uses, and graphite specialities, greases, jointing compounds, etc.

Stand D. 330. Thermal insulations, packings and jointings, etc., are a speciality of **Bell's Asbestos and Engineering, Ltd.,** and in addition to these, their stand shows steam valves and fittings, flow control valves for solids, and asbestos fire protective equipment.

Centrifugal Pumps

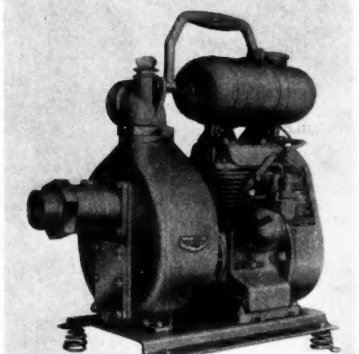
Stand C. 405. The extensive range of Beresford centrifugal pumps is again exhibited by **James Beresford & Son, Ltd.** Most interesting are their patent submersible electric pump, the Stork Baby pump, which is a single-stage, self-priming model, and the Beresford automatic pressure water system.

Stand C. 405. As at the 1951 B.I.F., **Birlec, Ltd.,** concentrate attention on their range of Lectrodryer equipment for the dehydration of air (particularly compressed air), other process gases and certain organic liquids. Two of the units are of the dual-adsorber type affording continuous drying service, and the third is the CHE model; small Lab-Lectrodryers are also shown.

Stand B. 517 and 416. **Fredk. Braby & Co., Ltd.,** exhibit fabricated sheet metal and metal platework, steel drums, metal partitions, perforated metals, aluminium products, copper and zinc roofing, etc.

Stand D. 545 and 442. **Geo. Bray & Co., Ltd.,** show their full range of flat flame and cylindrical jet coal gas burners, as well as a range of domestic incandescent and street lighting burners. Of particular interest are the special butane/air gas burners used at Whitland and specially developed by Brays.

Stand D. 723. Specialists in solving high pressure problems, the **British Ermeto Corporation, Ltd.,** exhibit their couplings and valves embodying the patented Ermeto sealing ring. The couplings are for pressures up to 20,000 p.s.i. and, like the valves, are available for steel, stainless steel, copper, aluminium and brass tubes.



This 2 in. contractors' pump by James Beresford & Son, Ltd., will raise 1,000/4,000 g.p.h. of dirty water containing solids; it has a maximum suction lift of 25 ft. It is supplied with a petrol engine drive (as illustrated) or electric motor.

Stand D. 201 and 100. A remarkable selection of oxy-acetylene welding, cutting, gouging, brazing, heating and flame cleaning equipment is shown by the **British Oxygen Co., Ltd.** Two additional blowpipes are exhibited, the Cutogen 3 and 5, the former being a heavy duty model, and the latter a general purpose blowpipe.

Stand A. 642. **The British Steel Wool Co., Ltd.,** presents Alco steel wool, manufactured for all purposes. Bulk reels, filter pads for air conditioning, and intake filters in steel, brass, copper, aluminium and other metals are also shown.

Stand C. 511 and 410. Electric plant and machinery for light and heavy industry, including motors, control gear, electronic equipment, is exhibited by the **British Thomson-Houston Co., Ltd.** Needless to say, Mazda lamps for specialised industrial applications are well to the fore.

Stand D. 615. An interesting variety of transmission and conveyor belting is shown by the **British Tyre & Rubber Co., Ltd.,** together with industrial V belts, anti-vibration mountings, moulded and extruded rubber products, anti-corrosive rubber linings and covering, and a range of hoses and tubing.

Industrial Cleaners

Stand D. 203 and 102. Well known for their range of industrial cleaners, the **British Vacuum Cleaner & Engineering Co., Ltd.,** are strongly represented. Among the equipment shown are the B.V.C. industrial portable vacuum cleaner, flue dust removal plant, pneumatic and mechanical conveying plant, and ash sluicing plant.

Stand D. 405 and 304. Gas fired and solid fuel gravity feed boilers are exhibited by the **Brockhouse Heater Co., Ltd.** Those fired by gas are for both hot water and steam supply. Gyral oil-fired burners are also shown.

Stand D. 435. Two multitubular vertical boilers are shown by **Cochran & Co., Annan, Ltd.,** one of them built in 1885 and just taken out of service. This interesting contrast is supported by several models of boiler and steam storage accumulators.

Stand D. 232. To help users of copper to make their quotas go further is the aim of the **Copper Development Association,** and on their stand display panels show examples of efficient and inefficient applications of copper and copper alloys in the chemical and other industries.

Stand D. 314. **Crane, Ltd.,** exhibit malleable iron pipe fittings, forged steel flanges; gunmetal, cast iron and cast steel valves for steam, water, oil and gas lines; and such items as steam traps, boilers, radiators, and accessories for heating and domestic supply.

Stand, Outdoor, 1304. Equipment exhibited by **Crane & Taylor, Ltd.,** includes a 60 ft. stacker, 20 ft. and 40 ft. models of a similar type, and an interesting 10 tons per hour mobile bag filler. A 15 tons per hour mobile disintegrator and a four-cage high speed disintegrator are also shown.

Solid Fuel Appliances

Stand 501 and 400. A variety of solid fuel appliances are shown by the **Eagle Range & Grate Co., Ltd.,** including domestic combination grates, back-to-back ranges, oven-over-fire grates, heating stoves, convector grates, and coke grates. Also shown are whole-house-warming units.

Stand D. 411. **F. J. Edwards, Ltd.,** present their range of sheet metal working machines, comprising power presses, guillotines, both power and foot operated, and various swaging and wiring machines. Various types of folding machines are also shown, together with tinsmiths' tools and accessories.

Stand C. 320. **Elliott Brothers (London), Ltd.,** show exhibits of four main types: Instruments for process control, electrical measuring instruments, electronic equipment, including magnetic amplifiers, and the Fisher Governor Company's products, valves,

etc. The first section is likely to be of most interest to readers, since it comprises a section of a large instrument installation for automatic control of furnace temperature for the continuous weld tube mills at Stewarts & Lloyds, Ltd., at Corby.

Stand C. 700. A wide range of instruments is to be seen on the stand of **Ether, Ltd.** Among them are Ether-Wheelco electronic temperature controllers, Indicorder temperature recorders, optical pyrometers, Forgemaster radiation pyrometers of both portable and wall type, potentiometers, Flame-o-Trol combustion safeguards, and solenoid and motor-operated valves.

Mechanical Handling Plant

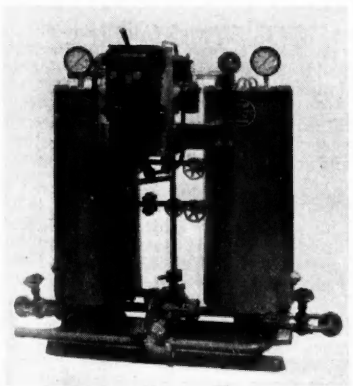
Stand D. 513 and 410. Working models of mechanical handling plant for bulk material and packages is a speciality of the **Ewart Chainbelt Co., Ltd.** Other exhibits on their stand include chains in malleable iron and steel for conveying, elevation, and transmission purposes, and also sprocket wheels, elevator buckets, etc.

Stand A. 609. **Falk Stadelmann & Co., Ltd.,** have two stands. On this one they display fluorescent and tungsten lighting fittings, cooking and heating appliances, cables and flexibles, and Coolex switchgear. On stand 529 they concentrate on oil-fired domestic appliances.

Stand D. 312. Insulation is now recognised as a key factor in effective house heating these days and on this stand **Fibreglass, Ltd.,** demonstrate just how wide are the applications of spun glass material for this and other purposes, such as pipe-wrapping, electrical insulation, etc.

Stand B. 524. The Gasel refrigerator which made one of its first public appearances at the Ideal Home Exhibition this year, is now presented at the B.I.F. by **Gasel Appliances, Ltd.**

Stand C. 503 and 402. The largest British electrical manufacturing organisation in the world, the **General Electric Co., Ltd.,** takes for its main theme the subject 'Research in Industry' and shows how research is applied to every field of manufacture of the Company.



The BWC 150 type Lectrodryer as used for drying compressed industrial gases. The unit exhibited by Birlec handles carbon dioxide for 'dry gas' manufacture.

Stand D. 212. A selection of Goodyear industrial rubber products is exhibited by the **Goodyear Tyre & Rubber Co. (G.B.), Ltd.,** including rubber impregnated conveyor and transmission belt, 'V' belts, endless cord belts, industrial hose.

Stand D. 305 and 204. Specialists in jointing and sealing compounds for gas, water, and steam applications, **Graphite Products, Ltd.,** exhibit their usual range of graphite greases and paints.

Stand D. 510. **E. Green & Son, Ltd.,** exhibit a cast iron vertical tube economiser, a cast iron oval tube air heater, a cast iron triple tube air heater, a Premier Diamond type 25 and type 12 economiser.

Dust Collecting Equipment

Stand D. 444. Among the items exhibited by the **Harris Engineering Co., Ltd.,** are automatic gas-fired overhead heaters, special plenum plants for use with ducting, unit dust collectors and complete extraction plants, and centrifugal and propeller fans.

Stand B. 329. **G. A. Harvey & Co. (London), Ltd.,** have as their main feature this year the ellipsoidal spun head which was exhibited outside the Dome of Discovery. The Company is able to manufacture pressure vessels, autoclaves, fractionating and absorption towers in steel plate up to 3 in. in thickness and of any diameter and length. Harco perforated metals and woven wire cloth are shown, as well as cable plating, gilled tubes, and office furniture, etc.

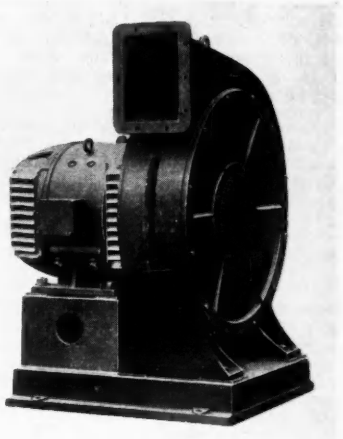
Stand D. 505. Dust collecting equipment is one of the specialities of **James Howden & Co., Ltd.,** and their stand shows examples of this type of equipment, together with forced and induced draught fans, secondary air fans, exhauster fans, air preheaters, as well as compressors and steam turbines for auxiliary purposes.

Stand D. 409 and 308. The Metals Division of **Imperial Chemical Industries, Ltd.,** show, in addition to general displays of sheet, strip, rod, extrusions, tubes, etc., the many applications of the Division's wrought non-ferrous metals in building and transport. In building, water, gas and sanitation services are represented by light gauge copper tubes, and a range of compression and capillary fittings.

Travelling Grate Stoker

Stand 617 and 516. **International Combustion, Ltd.,** exhibit a type 'L' travelling-grate stoker with a grate area of 100 sq. ft., a No. 3 Impax pulveriser, a 3-sq. ft. laboratory size rotary vacuum filter, a Vacseal rubber-lined pump for pumping abrasive materials, a scale model gravity bucket conveyor handling coal at 200 tons per hour, and a model of a 515,000 lb. per hour water-tube boiler unit.

Stand, Outdoor, 1335 and 1234. Among the types of equipment shown by **C. H. Johnson (Machinery), Ltd.,** are an immersion type concrete vibrator, conveyors, compressors, pipe laying winches, rammers, diesel pile drivers, paint line pumps, etc.



A Keith Blackman 36-in. type 9 'Tornado' cast iron blower designed to handle 4,500 cu.ft./min. against a resistance of 31 in. W.G.

Stand D. 755 and 654. Seven display stands are presented by **Keith Blackman, Ltd.** The first, for low pressure gas, contains mixture controllers, grid burners, shut-off valve and cut-off switch, and air blast injector, etc. The second, for high pressure gas, contains injectors, compressors, drip-proof burners, etc. Other stands deal with back pressure valves, a suction burner with combustion chamber, etc.

Stand D. 143. The **Kleen-e-ze Brush Co., Ltd.** (Industrial Division) exhibit condenser cleaning guns and bullets, flow-breakers, Keza tube cleaners, brush strips, dust allaying fluid, and other types of industrial and mechanical brushware.

Stand B. 630. **James H. Lamont & Co., Ltd.,** have devoted their stand to copper pipe fittings, Securex patent improved fittings for light and heavy gauge copper tubes for cold and hot water supply and steam heating.

Industrial Brushes

Stand A. 640. An interesting selection of brushes for a wide variety of industrial purposes are shown on this stand by **A. Luson & Sons, Ltd.** A number of wire brushes are also displayed.

Stand B. 525. Well-known for their range of Foochow industrial finishes, **Donald Macpherson & Co., Ltd.,** have an attractive exhibit which demonstrates the properties of their various products. Heat resisting, low stoving, air drying and infra-red synthetic enamels are shown, with a wide variety of lacquers, cellulose, and enamels for the protection of steelwork and buildings.

Stand D. 639 and 538. Among the products of the **Midland Iron Co., Ltd.,** on show at this stand may be mentioned the sections of wrought iron and steel and examples of hanger bars, shoe bars, and coopers' hoops; can bottom sections, etc., are also shown.

Stand, Outdoor, 1334. Specialists in earth moving and material handling equipment, **Jack Olding & Co., Ltd.,** show the well-known Vickers matched earth moving equipment, VR.180 tractors powered by 180 H.P. Rolls-Royce diesel engines, with a range of ancillary equip-

ment. On stand outdoor 1350 Barber-Greene Olding & Co., Ltd., exhibit the 44C ditcher which digs trenches up to 24 in. wide to a maximum depth of 8 ft. 3 in.; the Standard and Junior finishers are also shown.

Stand D. 440. An interesting selection of gas-heated infra-red drying equipment is exhibited by **Parkinson & Cowan (Gas Meters), Ltd.** Included are tunnels, horizontal and vertical panels, conveyors and industrial finishing equipment, as well as laboratory test meters and pressure gauges.

Stand D. 642. As in previous years, **Pegson, Ltd.,** have a comprehensive display of their range of centrifugal self-priming pumps.

Stand A. 322. Makers of the Prestige pressure cookers, **Platers & Stampers, Ltd.,** exhibit these in conjunction with their Wonder oven, Prestrig kettle, and other types of kitchenware.

Dismantling Made Easy

Stand D. 129. To facilitate the dismantling of rust-bound machinery and for the protection of new and reassembled plant, the **Plus-Gas Co., Ltd.,** have produced their formulæ 'A' and 'B' fluids. Their products are demonstrated on request on their stand.

Stand D. 757 and 656. **Radiant Heating, Ltd.,** concentrate this year on industrial process heating plant, and accordingly their whole range of industrial gas burners are shown, operating from a Premix-gas and air incorporator. Duoflam conversion sets (obtainable in 1,000 sizes) are shown, together with a cremator, salamander, toaster, and the firm's range of space heating equipment.

Stand B. 501 and 400. The Solid Fuel Division of **Radiation Group Sales, Ltd.,** have on show an impressive range of cookers, ranges, convector fires, stoves, etc., including a glass panelled unit demonstrating the whole-house heating system. Making its first appearance is the No. 32 Raymax Mark II, which is connected to a hot water cylinder and is under fire. Other new models are the Yorkvale heat retention cooker, the Yorkist 12 combination grate, and the Cheston overnight burning grate.

Stand C. 707. The list of exhibits on the stand of the **Rawlplug Co., Ltd.,** is too long to publish here, but special mention might be made of the Screw-anchors, Boltanchors, Rawlanchors, alloy chisels, girder clips, and the Durolastic sealing compound.

Stand D. 607. **John Rigby & Sons, Ltd.,** specialists in high and low carbon steel wire, also exhibit precision drawn pinion rods for all mechanisms, Tectic oil tempered spring wire, and brush wire, and powder metal process parts.

Stand D. 706. The properties of the various barrier creams, etc., manufactured by **Rozalex, Ltd.,** are well displayed on their stand; the Company has a fine record for the prevention of dermatitis and similar complaints.

Stand A. 327 and 226. Makers of the Dainty Minor gas cooker, **R. Russell & Sons, Ltd.,** display this appliance to good advantage, emphasising its suitability for the smaller households and flats, its good finish, hotplate with two boiling burners and griller, automatic heat control to the oven, etc.

Stand D. 125. The Diaphragm Valve Division of the **Saunders Valve Co., Ltd.,** features a 10-in. cut open handwheel valve, which illustrates the isolation of mechanism, streamline flow, glandless construction, etc. A working model of a power-operated diaphragm operated valve, arranged for remote control by means of a three-way taper plug cock is another feature. Many static exhibits are also shown. The Saffran Pump Division also has some outstanding exhibits, notably a 1½/2 in. self-contained set operating from a suspended cradle.

Stand D. 239. **Senior Economisers, Ltd.,** exhibit economisers of three main types: the Senior-H tube type for industrial plants; the Twintube, for higher pressures as used in power stations; and welded for pressures up to the highest, when the feed-water is suitably conditioned. It is claimed that the straight, uniform gas passages are self-cleaning and keep the rate of heat recovery constant.

A type GQ4 4-in. portable electric heavy duty grinder, exhibited by Wolf Electric Tools, Ltd.

Stand D. 251. Well-known for their breathing apparatus and protective clothing, **Siebe, Gorman & Co., Ltd.,** exhibit a remarkable range of self-contained breathing apparatus, smoke helmets, gas masks, resuscitation apparatus, goggles, etc.

Stand D. 321 and 218. The **Sigma Instrument Co., Ltd.,** exhibit multi-dimension inspection machines in operation; they are hand-operated, semi-automatic and fully-automatic for the rapid inspection of mass production. Also shown are mechanical comparators for quality control at the machine.

Stand D. 407 and 306. Among the wide range of products displayed by **James Southern, Martineau & Smith, Ltd.,** are the following: Gas cocks, main cocks, unions, spraying machines, plumbers' brasswork, lubricators, steam and water fittings, bib cocks, stop cocks, etc.

Stand D. 407 and 306. A particularly interesting exhibit on the stand of **Spencer-Bonecourt, Ltd.,** is a scale model of the closed cycle air turbine unit and waste heat boilers being installed for the West Midlands Gas Board. A number of illustrations of typical waste heat boiler installations are included.

Stand D. 543. A complete suite of G.805 thermo-magnetic flame failure valves is one of the interesting features on the stand of **Sperryn & Co., Ltd.** Another is a demonstration of the G.807 multi-burner flame failure device with which it is possible to control up to 12 burners. The recent modification of this device is essentially a substitution of the thermo-couple by a power rack, output being stepped down to 6 volts, 3 amps, D.C., from 230 volts A.C. The Company's full range of thermostats, Sperson cocks, and fittings is also to be seen.

Stand, Outdoor, 1322. **The Stanton Ironworks Co., Ltd.,** present their usual wide range of concrete and other products, among them being spun concrete pipes, flexible joints, manholes, bends, junctions, sleepers, flags and kerbs, spun concrete lighting columns, treated and dry slag, etc.

Stand D. 313. A remarkable variety of refractories may be seen on the stand of **John G. Stein & Co., Ltd.** In addition to high alumina and basic refractories, examples are shown of silica bricks, fire bricks, cements and patches.

Stand D. 515. **Stelcon (Industrial Floors), Ltd.,** have a stand of which the floor is formed of Stelcon anchor steel plates. There is a full-size exhibit of Stelcon storage walls and a display of scale models showing examples of storage bins formed with these wall units.

Tubular Products

Stand D. 511/408 and Outdoor 1339/1238. The first stand of **Stewarts & Lloyds, Ltd.,** in the Engineering Group, features a section of 72-in. sheathed and lined steel main into which five panels have been inserted, each containing a colour transparency illustrating stages in the manufacture, protection, and laying of large diameter steel mains. The outdoor stand is mainly devoted to tubular products, and among the products to be seen are steel tubes for the conveyance of steam, gas, air and water, steel strip, castings, weld boiler tubes, lighting columns, etc.

Stand D. 301 and 200. Among the products displayed by **Richard Thomas & Baldwins, Ltd.,** are the following: Flat rolled steel products of many types, light alloys, fabrications from steel and alloy in many forms, transformer sheets, etc.

Stand D. 521 and 418. **John Thompson, Ltd.,** claim to supply industrial boiler house plant, 'from the foundations to the turbine stop valve,' and their stand illustrates some of the types of work undertaken, ranging from steam generating plant to pressed steelwork and coal and ash handling plant.

Stand D. 639 and 538. A fine set of photographs illustrate the heavy industrial activities of **Thos. W. Ward, Ltd.,** including iron and steel production, and general, mechanical, electrical and civil engineering.

Stand C. 300. One of the largest manufacturers in this country of gas list tubes and fittings, **Wellington Tube Works, Ltd.,** shows a 10-in. bore steam main incorporating a 6-in. nominal bore long radius 90° welding fitting. A small heat exchanger, drop forgings, and illustrations of tubular fabrications complete the exhibits.

(*Concluded at foot of opposite page*)

GAS INDUSTRY TEAM RETURNS FROM UNITED STATES TOUR

THE team from the gas industry which has been visiting the United States under the auspices of the Anglo-American Council on Productivity returned to this country. Their visit has taken them to many parts of the United States, from the East Coast to the West, the itinerary including New York, Cleveland, Chicago, Portland, Los Angeles, Alabama, Philadelphia, Pittsburgh, Cincinnati, and Washington. The team has covered more than 8,000 miles by train, in addition to the 6,000 miles of the sea voyages. Immediately on the team's arrival, contact was made with the American Gas Association, which provided an excellent resumé of the activities of the industry in America, in addition to entertaining members. Visits have been paid to many of the leading gas companies in the U.S.A., to laboratories, companies manufacturing appliances, and to the Institute of Gas Technology. The team's reports will be published, as soon as can be arranged, by the Anglo-American Council on Productivity.

Rugby Football at Abertillery

AS a sequel to last year's successful match, Mr. Ivor Preece (George Wilson Gas Meters, Ltd.) led another strong representative XV against Abertillery R.F.C. on April 23. The team was entertained at tea before the match by the Wales Gas Board. Preece's XV won a most enjoyable game 19—8. The team was as follows:

W. D. Grove (London University and Saracens); G. Rowlands (London Hospital, United Hospital, and England trials); G. Cullen (Leicester and England trials); S. J. Sanders (Old Sichillians and Warwickshire); P. T. Baines (Fylde, Lancashire and Army); I. Preece (Coventry, Warwickshire, Barbarians, and England); W. K. T. Moore (Leicester, Barbarians, and England); D. G. Naylor (Coventry Cardiff, and Warwickshire); E. R. Blackburn (Coventry, and Warwickshire); D. Hayward (Newbridge, and Wales); R. Titchen (Saracens, and Navy); S. J. Adkins (Coventry, Warwickshire, Barbarians, and England); D. Ibbotson (Gloucester, and Somerset); J. McG. Kendall-Carpenter (Penzance, Oxford University, Cornwall, Barbarians, and England); R. J. Batstone (Coventry, Warwickshire, and England).

After the match Mr. D. S. Davies (Engineer and Manager, Abertillery undertaking and Chairman, Abertillery R.F.C.) announced that it had been agreed to make it an annual fixture. Short speeches followed in which the good spirit of rugby and the evening's game in particular were mentioned. Next day most of the team travelled to Kenilworth for another match against an Invitation XV organised by Kenilworth R.F.C. In this match Philip King, of the *Gas Journal* staff, played on the left wing.

BRITISH INDUSTRIES FAIR

Stand D. 639 and 538. The **Widnes Foundry & Engineering Co., Ltd.,** has an exhibit representing cast and fabricated vessels and plant in cast irons, mild and stainless steels for the gas, chemical oil, food, and other industries. Special castings in high-duty irons, including Ni-Resist, are also shown.

Stand C. 603. A comprehensive display of electric tools and equipment is displayed by **Wolf Electric Tools, Ltd.** Electric drills range from the ¼ in. EG2c, up to the 1¼ in. type NW10 models. Portable electric screwdrivers, drills, grinders, and blowers, are included, as well as engine reconditioning equipment.

Stand D. 708. **Wright, Bindley & Gell, Ltd.,** exhibit light metal pressing and stampings of many kinds. One of their subsidiaries, **Messenger & Sons (Birmingham), Ltd.,** have an excellent display of hot brass pressings for the gas industry.

Stand B. 723 and 634. The **Yorkshire Copper Works, Ltd.,** display an astonishing variety of tubes of all kinds. The well-known Yorkshire tubes vary from 0.002 in. bore to 24 in. diameter. An interesting exhibit shows air emerging from more than a mile of 0.019 in. diameter tubing drawn in one continuous length.

Coal Price Increases Absorb Savings

INCREASED prices imposed on the gas industry as a result of the new price structure of the National Coal Board, 'which appeared to place an unfair burden on the gas industry as compared with electricity and general industry.' evoked frank comment at the annual meeting, at Grantham, of the East Midland Gas Consultative Council, presided over by Alderman C. R. Bates, O.B.E., J.P., of Derby.

The Council had recently expressed serious concern in the matter and, following representations at high level, members were informed that replies received were not satisfactory, and the meeting decided to press for more information from the Ministry to enable them to reach a decision.

Increase Too Great

'We feel,' said the Chairman, 'that the increase has been too great in comparison with other industries. It is greater in the case of the gas industry than in any other, and we feel it is not fair. I do not know what else we can do beyond pressing for some action to be taken to secure some equalisation of charges made to the gas industry in relation to the others.'

During the debate, one member suggested that the fullest possible information should be given to the Council, including comparative figures of prices and quality.

The meeting unanimously agreed that a resolution embodying the members' views should be forwarded to the Board.

The third annual report of the Council for the year ended March 31, 1952, stated that since the nationalisation of the industry on May 1, 1949, the increased working costs incurred within the Board's area and entirely beyond its control had amounted to over £3 mill. per annum, of which a progressive total now estimated at an annual rate exceeding £600,000, had been absorbed through integration of undertakings, increased operating efficiency, and other economies arising from bulk buying and central purchasing of materials.

A Coke Screening Plant at the Spalding undertaking of the East Midlands Gas Board has been completed as part of the improvement scheme begun in 1948. Total cost of the scheme is £130,000. The coke plant handles 10 tons of coke an hour and each bunker holds 100 tons.

Midland Juniors' President's Day

Successful Day at Coventry and Leamington

THE Midland Junior Gas Association honoured their President in traditional style on April 24, when nearly 200 members visited Coventry and Leamington on President's Day. This was the highspot of Mr. R. B. Watkins' particularly successful term of office and in the future he may with justice look back on this as being another landmark in the long history of the Association.

Members assembled at Coventry's Gas Street Distribution Centre where they were provided with light refreshment before commencing their tour of inspection. They were able to visit the fittings department and meter shop, the stove shop, mains store, and governor house before moving on to the industrial department in Abbott's Lane.

The industrial department in Coventry covers such activities as the sale and installation of all industrial, space heating and catering equipment, as well as heat treatment services. It was formed as a separate section of the City of Coventry Gas Department, 1930, its purpose being to give advice to the larger industrial consumers on the most efficient type of apparatus to be used for particular needs. The heat treatment shops were established in 1940, and the present site was taken over in 1947, when all the various facilities were housed in one building. In addition to office accommodation, the department contains refractory stores, descaling room, carburising packing bay, meter and compressor house, heat treatment shop, general workshops, and catering equipment showrooms; a new industrial showroom will also be included in the near future.

An Interesting Greenhouse Installation

The next port of call was the central nursery at Canley to inspect the greenhouses. The Parks, Cemeteries, and Allotments Department plays an important part in Coventry where the population has increased from 178,000 persons in 1928 to 240,000 persons in 1951. The area under the care of the Parks Department has increased at a much greater rate—from 232 acres to 940 in the same period, and that does not include the cemeteries, which have doubled their area.

Apparently the greenhouses were previously scattered all over the city, thus entailing extra expenditure. The houses are now being reconstructed on the one site, and new houses of 12,000 cu.ft. capacity are to be added. Of the existing houses, that of aluminium construction accounts for 74,673 cu.ft. capacity, and those of wood, 46,110 cu.ft. capacity. The houses are heated by two Ideal 3GBA7 gas-fired boilers, each having a rated capacity of 650,000 B.Th.U. per hour; the estimated load of the aluminium house is 845,000 B.Th.U. per hour. An accelerator is fitted to the system to ensure perfect water circulation.

Adjacent to the nurseries is the Coventry Corporation Crematorium, equipped with two 'Askan' gas-fired cremators; the chapel is heated by Bratt Colbran bowl pattern overhead heaters.

After the morning visit, members were conveyed by coach to the Chesford Grange Hotel, where they were entertained at lunch by the West Midlands Gas Board.

The toast of 'Her Majesty the Queen' having been proposed by the President, **Mr. D. J. Ward,** Senior Vice-President of the Association, rose to propose 'The West Midlands Gas Board.' He said that he had heard this toast proposed on many occasions and by many people, and all the proposers seemed to have known the Board very well. It was an honour which he could not claim, although, of course, they all knew Mr. G. le B. Diamond, the Chairman of the Board, as a leader who inspired both trust and confidence. But they had with them Mr. Lee, the Deputy Chairman, someone he could really claim to know. Indeed, Mr. Lee was known to them all as being both approachable and likable, and they were delighted to learn of his appointment. He was a Birmingham man and they felt that he was one of themselves; and although they knew he looked upon all the undertakings in the area as his responsibility, he had, they believed, a soft spot in his heart for Birmingham. Mr. Diamond and Mr. Lee must have been extremely gratified to know that on the basis of therms per ton the West Midlands Gas Board came out on top, an achievement due in no small measure to the results obtained at Birmingham. If theirs was not the best area board it was at least one of the best, and as long as they had Mr. Diamond and Mr. Lee it would continue to go from strength to strength.

Responding, **Mr. Alex W. Lee,** Deputy Chairman of the West Midlands Gas Board, explained that he was deputising for Mr. G. le B. Diamond, who had to speak at the Conference, at Stratford-on-Avon, of the Women's Gas Federation. This he was very pleased to do for it gave him the opportunity of meeting a number of old friends and colleagues in the gas industry in the Midlands. He was particularly interested in this meeting because he wanted to support their President who, at one time in his career and in the period in which he learnt his job as an industrial gas officer, was a member of the City of Birmingham Gas Department.

Facts and Figures

The Board had now been in operation for some three years and the work it was doing could be told in figures. It had to provide gas and services for some 4½ mill. people living in an area of 4,800 square miles over five counties. To produce its output of some 70,000 million cu.ft. per annum, it had to purchase 3¼ mill. tons of coal and over 18 mill. gal. of oil. Its annual turnover was about £26 mill. sterling; it controlled 67 undertakings and employed over 13,000 people.

Since the Board was formed, it had had in mind two important objects: To give the best possible service to its consumers; and to ensure that every employee had reasonable conditions of service. As regards the first object, the Board had accomplished a great deal since vesting date. Some of the undertakings which were taken over on the nationalisation of the industry had plant in poor condition and inadequate distribution systems due, in a large measure, to the inability of the former owners to maintain them during the war years. The Board had done much to rectify this state of affairs. A considerable sum of money had been spent in bringing the gasworks throughout the area into a good state of efficiency, while the distribution systems had been vastly improved and today, he was glad to say, there were few places in the area where a good service was not being given to consumers. To give but one example of improved efficiency, the average yield of gas per ton of coal carbonised had increased during the year just ended by 0.4 therm to 78.4 therms. This apparently small improvement in fact represented a saving of nearly 17,000 tons of coal, costing £63,000 in a year.

While a lot had been done, there was still a great deal more to accomplish. The West Midlands Gas Board had a greater potential output of gas, particularly for industrial purposes, than any other Board, and they had been obliged, owing to the lack of plant, to refuse industrial loads to the extent of some 9,000 mill. cu.ft. per annum, a quantity of gas more than one-and-a-half times the output for a city the size of Coventry. This was one of their problems and the Board had made plans for increasing the size of some of its gasworks and the building of new ones in the years to come. Their capital commitments in this respect at the present time amounted to no less than £14 mill.

Trend of Gas Outputs

The gas output of the constituent gas undertakings in 1938 was 38,000 mill. cu.ft. and this had risen in 1949-50 to 64,000 mill. cu.ft., an increase of 68%. For the year ended March 31, 1951, the output of gas had increased to 69,000 mill. cu.ft., an increase of 8.2% over the previous year. The output for the year ended March 31 of the current year indicated a still further advance, the figure being over 70,750 mill. cu.ft. Domestic consumption in the year ended March 31 last was 43% of the total, while the industrial sales represented 46% of the gas sold, though the proportion varied from 11% in the rural division of Shropshire to 63% in the Black Country. The industrial sales, which were greater than any other Board, had been limited because of the shortage of manufacturing plant and the future rate of increase had been assumed to be 5.2% compared with the 11.6% achieved in 1950-51.

The installed manufacturing capacity at vesting date was 251.4 mill. cu.ft. per day. To this had been added further

manufacturing plant in the years 1949-50 of 11 mill. cu.ft. per day. During 1950-51 further substantial progress was made with the completion of additional plant to the extent of 19 mill. cu.ft. per day, bringing the total installed capacity on March 31, 1951, to 281.5 mill. cu.ft. per day. In the year just ended additions to the extent of 6.7 mill. cu.ft. had been added so that the total capacity had now reached the figure of 288 mill. cu.ft. per day.

The existing restrictions on capital development had influenced the Board's general plan for the development of the West Midlands area. It was now clear, for example, that it was no longer possible to entertain the idea of concentrating the manufacture of gas in a limited number of large stations at strategic places throughout the area so that inefficient and badly sited plants could be closed down. The more immediate policy of the Board was, therefore, directed to the completion of the reconstruction of production plant that was already well advanced, together with the improvement in efficiency of existing manufacturing stations, coupled with the additions of units of manufacturing plant where these could be accommodated on existing sites. A limited number of schemes for the integration of adjacent undertakings would also be carried out if the approval of the Ministry was given and the necessary pipes were forthcoming.

Plan for the Central Area

This area consisted of the densely populated conurbation of the City of Birmingham, Coventry and the Black Country, which contained some of the most important industrial and manufacturing districts of the whole country. The Board had in hand a large extension scheme at the Swan Village works of the Birmingham Undertaking, which, when completed in the winter of 1952-53 would add 8½ mill. cu.ft. per day of carbonising capacity and 2.5 mill. cu.ft. per day of carburetted water gas plant to the manufacturing resources of the central area. In addition, the Board was carrying out extensions at the Smethwick gasworks to provide additional capacity of 4.8 mill. cu.ft. per day and at the Walsall works major extensions of 12 mill. cu.ft. per day were in progress. At Coventry, where there was a deficiency in manufacturing capacity, the Board had in hand the construction of new carbonising plant to the extent of 12½ mill. cu.ft. per day and the erection of a 6-mill. spiral-guided gasholder. Extensions were also in hand at Tipton, Bilston and Wolverhampton, which would add approximately 9 mill. cu.ft. capacity to the manufacturing plant in those districts.

As circumstances permitted it was the intention of the Board to bring about a more closely knit integration of the undertakings in the central area so that manufacturing resources were used to the best advantage for both base and peak loads. This, however, was an ambitious scheme which would involve a costly main-laying programme and the establishment of central control units to ensure the efficient use of manufacturing plant. The Board had inherited the elements of a trunk main distribution system extending from Birmingham to Coventry and Rugby in the south and running from Washwood Heath through Smethwick to Dudley in the west. Unfortunately, the sizes of some of these mains were insufficient for long-term purposes but would serve well enough for the next ten years. The Board had planned the trunk distribution mains upon the inherited system and intended to connect Kenilworth and Leamington to the Coventry-Birmingham main at an early date and to establish at Washwood Heath a central distribution unit equipped with modern and efficient gas compressing plant of large capacity. The trunk main already extended through Smethwick some distance in the direction of Walsall and the Board had already approved a scheme for connecting this main with the projected gasholder station at James Bridge, Walsall. It was anticipated that, on a long-term basis, the James Bridge gasholders at Walsall would be connected with Wolverhampton and, through suitable link mains, the manufacturing plant at Bilston, Tipton, Dudley and Smethwick would all be connected to the trunk main.

Coal Requirements Growing

With the rise in plant capacity, it was estimated that the annual coal requirements of the Board would rise in five years to 4 mill. tons, an increase of 25%, and in eight years to 4½ mill. tons, an increase of 31%. Until it is known for certain that the carbonising coal would be available, the Board would not contemplate commencing the construction of a new large works at Willenhall, even if sanction for this project was obtained from the Ministry of Fuel and Power and from the planning authorities.

Sales and Service

The Board had so far been able to supply all the gas requirements of the new housing estates and had carried out main-laying to the extent of approximately 100 miles per annum. They had not been in a position to meet the demands for industrial gas to the extent of approximately 9,000 mill. cu.ft. per annum, the Board taking the view that to accept applications for supply when the plant capacity was not there to meet them could only end in dragging down the supply position to the whole body of consumers.

While the Board had been fully occupied with improving its works and services to consumers, it had not lost sight of the welfare of its employees. One of the duties imposed by the Gas Act was that every Board should promote the welfare health and safety of persons in the employment of the Board. They had endeavoured to do this; at some works it was found that conditions were below a reasonable standard and a great deal of improvement had been achieved in the last two years. Various schemes to improve working conditions had been authorised, new canteens had been brought into operation, and the medical service scheme had been extended. Schemes for further training and education had been promoted by the Board and he could not stress too much their value. The Board was short of technical administrative staff throughout its area and there were many openings for employees who had the necessary qualifications and training.

The Midland Junior Gas Association had the full support of the West Midlands Gas Board. After all, many of the senior technical officers of the future would be drawn from members of the Association. This was the forty-eighth year of the Association's activities and its membership was now in the neighbourhood of some 500. Looking through its lists of Presidents and members in the years gone by, reference would be found to many men who had gained great eminence in the gas industry. He would commend to every area board member that very excellent article in a recent issue of the *Gas Journal* by Mr. J. T. Haynes, the Junior Vice-President of the Institution of Gas Engineers, on 'The Rising Generation.' He heartily agreed with Mr. Haynes that there were many bright days ahead for the younger members of the staff. If the gas industry was to maintain its present position, it must look to the younger men to fill the higher technical positions in the future. The remuneration offered in the higher posts was attractive and compared very favourably with comparable positions in other industries. So far as the West Midlands Gas Board was concerned, it would prefer, so long as the individual had the necessary qualifications, to fill vacancies from its own district, and he could not stress too much the desirability of every junior technical officer taking advantage of the facilities of further education and advancement which the West Midlands Gas Board was prepared to offer.

The Association Toasted

The task of proposing the toast of 'The Midland Junior Gas Association' fell to **Mr. Duncan Wright,** Managing Directorof Si dney Flavel, Ltd. He had, he said, been looking through the list of Past Presidents and had observed that their first President was Colonel F. J. Bywater. His Company, as they were probably aware, had had a very intimate connection with the former South Metropolitan Gas Company, of which Colonel Bywater had lately been a director. Since the days when Colonel Bywater was their Chairman much progress had been made in the industry which they all strove to serve.

The days of the 'kitchener' and the black cooker were happily of the past. The industry now endeavoured to provide gas to its consumers in its most efficient form. His Company was one of the oldest manufacturers of gas appliances in the country and had endeavoured throughout its long life to associate itself with the gas industry and to serve it in a progressive manner. In this connection, the names of his predecessors in office, the late Percival Flavel and Arnold Jackson would not be unknown to them.

The nationalisation of the gas industry had wrought many changes. For themselves, speaking frankly, they had all looked upon nationalisation with some trepidation and anxiety as they did not know what the future would unfold. As manufacturers, they were pleased to say that they found the new régime to be a very happy continuation of the former association with gas

companies and municipal undertakings. Changes had certainly taken place, but they found that old friendships in the industry continued to exist as heretofore.

They had endeavoured to modernise their factory and to introduce the latest methods of manufacture, and he felt sure that they would be impressed with all they saw at the works and the efforts which were being made there to produce appliances which would prove satisfactory both to them as engineers and to their consumers.

Unfortunately, they were living in difficult days of increasing cost and their endeavour at all times was to keep the price of their appliances at moderate levels. In these days, one must make some contribution to the National welfare. It was his firm conviction that if every manufacturer endeavoured to hold prices and to absorb, in so far as he was able, increases forced upon him, the danger of inflation would quickly pass in this country.

Responding, the **President** said it was a great privilege and pleasure to occupy the Chair and to know that his efforts on behalf of the Association had been appreciated. He was particularly grateful to the West Midlands Gas Board for the support which they had given in every possible way, and to Mr. Allen, Divisional Manager of the Warwickshire Division, and to Mr. West, District Manager at Coventry, who had given him a completely free hand to carry out his Presidential duties; he was grateful, too, to his personal colleagues in Coventry and in the Warwickshire Division. He was, he believed, the forty-seventh President of the Association, and he felt members would like to know that they had asked their Hon. Secretary, Mr. H. J. Reynolds, to take the office of Junior Vice-President, so that he would become President on their fiftieth anniversary.

'The Guests'

Proposing the toast of 'Our Guests,' **Mr. A. Allen** said it was a toast which he was confident would meet with unanimous approval. Their President, who was most highly esteemed in Coventry and, indeed, in the whole division, would probably wish him to mention particularly those members not formerly in the Warwickshire Division but who were their guests on this occasion. And among the special guests he would like to single out Mr. G. R. N. Sperryn, Managing Director of Sperryn & Co., Ltd., Mr. A. A. Brockliss, Sales Director of the same Company, Mr. C. W. Green, Midland Area Manager of Stotts of Oldham, Councillor H. Stanley, Vice-Chairman of the Parks Cemeteries and Allotments Committee of the City of Coventry Corporation, and Mr. Duncan Wright, Managing Director, and Mr. F. M. Rogers, Sales Director, of that old-established firm of Sidney Flavel & Co., Ltd., whose works they were to visit that afternoon.

Replying, **Councillor Stanley** said it was a great privilege to be with the Midland Juniors on this occasion and to have the opportunity of responding to this toast. He had been Vice-Chairman of the Gas Committee at Coventry until nationalisation; it seemed that just when he was getting to the top of the ladder it had been taken away and he had fallen down! Fortunately, however, the undertaking did not rely only on individuals; it relied on the sincerity of all those associated with it. Having congratulated both Mr. Watkins and Mr. Lee, Councillor Stanley said that everyone was watching the gas industry, not only in the Midlands but in the whole country. It had a great task and great difficulties to overcome, but he believed that with the right men for the job, giving the proper amount of thought to their undertaking, there was no reason to doubt that the industry would continue to progress as it had in the past; he wished them all every success in their venture.

Visit to Flavel's

Later, members were conveyed to the Leamington works of Sidney Flavel & Co., Ltd., there to inspect the processes involved in the manufacture of the Flavel range of gas and coke appliances. Among the many items of their tour which interested the Juniors, particular mention might be made of the testing of thermostats and governors on arrival, the grinding of the enamel pigment in revolving drums, a fine new automatic enamel spraying machine, the testing of enamel thickness, some outstanding machines in the press shop, and the laboratory and testing department.

When the visitors were entertained to a meal in the firm's canteen, Mr. Duncan Wright, Managing Director, gave them a warm welcome, the President expressed his appreciation, and Mr. F. M. Rogers, Sales Director of Flavels, added a word. Mr. J. A. Tomes, Vice-President, proposed a vote of thanks to the Association's hosts.

VISIT TO C. & W. WALKER, Ltd.

SOME 60 members of the Midland Junior Gas Association visited the works of C. & W. Walker, Ltd., at Donnington, Shropshire, on April 3, and spent a very interesting afternoon in going round the works.

Three parties were conducted respectively by Mr. S. M. Milbourne, Chairman and Managing Director, Mr. J. C. K. Balfry, Works Engineer, and Mr. F. B. Bott. A large number of purifiers and gasholders were seen in course of construction, including a 5 mill. cu.ft. for erection at Sheffield.

The party was later entertained at tea in the works canteen, when Mr. Milbourne welcomed all the members and stated that he believed it was some 40 to 50 years since they had received a visit from a junior gas association. He mentioned that the Company celebrated its jubilee as a limited company in 1948, but that the business was founded as a firm originally in London in 1837, and in its early years supplied hydraulic machinery to Beckton. The business was removed to its present home at Donnington in 1857. In 1913 the Company constructed the largest gasholder for Sydney, Australia, with a capacity of 12½ mill. cu.ft., and at present they had under construction a large number of holders for various undertakings throughout the country. They had many employees who had been with the firm for many years, including a few who had served for as long as 60 years.

Mr. R. B. Watkins, President of the Midland Junior Gas Association, thanked Mr. Milbourne and the Board of Directors for the opportunity to visit their works and for the hospitality offered. Further expressions of thanks were made by Mr. D. J. Ward, Senior Vice-President, and Mr. J. H. Reynolds, Secretary of the Association.

An interesting feature was mentioned in regard to the works canteen, now of modern construction and service. Originally the late Mr. Charles Walker had started a pioneer effort for the comfort of the workpeople as long ago as 1870 when facilities were provided for the heating of food brought by themselves and for a regular hot water supply.

TEMPERATURE RECORDING INSTRUMENTS

A NEW British Standard makes recommendations for the temperature ranges of charts used in recording instruments actuated by gas expansion, mercury-in-steel, platinum-rhodium-platinum-thermocouple, resistance thermometer, and radiation pyrometer.

As the preferred ranges have been compiled from data supplied by many instrument manufacturers their calculation has been achieved by grouping and consolidating the ranges favoured by individual users. Where minor differences in starting point and range were encountered during compilation they were embodied, wherever possible, in one range containing their maximum and minimum temperatures.

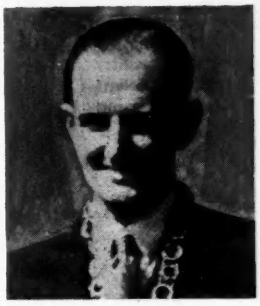
There are in use many preferred ranges which are peculiar to a particular industry or process, and these have been included in the ranges specified in this standard. In most cases these special ranges have developed from the need to provide openness of scale at important temperatures, and their use requires some special arrangement of the measuring system in order to provide the necessary sensitivity.

Although these chart ranges embrace the whole of the useful temperature scale it is appreciated that not every instrument manufacturer will be in a position to adopt them in their entirety, especially since some of them are for use in conjunction with particular types of measuring systems. Further, the use of the whole of such a comprehensive selection of ranges is unnecessary when instruments are manufactured for a particular section of industry.

Copies of this standard may be obtained from the British Standards Institution, Sales Branch, 24, Victoria Street, London, S.W.1. Price 2s.

Problems of

THE SCOTTISH GAS INDUSTRY



By E. G. SMITH,

Deputy Controller, Glasgow Division, Scottish Gas Board.

Presidential Address to the Scottish Association of Gas Managers, Spring Meeting, Rhu, Helensburgh, April 18, 1952.

OVER many years the subject of amalgamation of the two senior Gas Associations in Scotland was raised then laid aside—not that a common basis of union was found impossible, but the earlier proposals appeared to lack enthusiastic support. The two Associations, similar in design, with virtually the same personnel as members, attempted at different times to achieve the same purpose, but progress seemed to be impeded by divided loyalties. It is known to you that the Councils of both Associations entered into long and serious consultations and only when they were satisfied that the best interests of all would be served by union were their findings brought before the members.

The passage of the 'Bill' was lengthy, and, as the Council expected, was stormy. From it all there has emerged a reasonable, practical, and timely solution. It is inevitable that, in a merger, one party has to be the 'big brother,' but it is well to remember that everyone has a responsibility to contribute to the whole. The new constitution is wide in its conception and is framed to accommodate the changing conditions of personnel within the industry, and to have proceeded further would not have been in the best interests of our members at the present time.

Specially worthy of recognition for work done during the negotiations were Mr. Brown and Mr. Kirk, Secretaries of the North British Association, and Mr. Philp, Secretary of the Waverley Association. In the latter stages, when the legal mind was required, we were indeed fortunate in having Mr. Herd, Secretary of the Scottish Gas Board, to undertake this task; his counsel and assistance were invaluable.

It is fitting that I should comment upon the passing of these Associations and pay a sincere tribute to their endeavours and achievements. The gas industry in Scotland owes a great debt of gratitude to those who, unsparing in effort, conducted and guided these Associations throughout the years. That these Associations were recognised as an integral part of the industry is a measure of the success that attended their efforts.

Recruitment

The continuing deficiency in the number of entrants to the technical side of the industry is a matter of grave concern to all of us, and while it is not unknown to other industries I feel that with what we have to offer we should attract greater numbers from the available market.

Students of Senior Leaving Certificate standard, formerly our main source of supply, are more than ever determined on day study at universities and colleges, with a consequent reduction in the numbers available to industry. Over recent years educational statistics show a large increase in the number of graduates in technology, and the fact that the attraction in industry lies elsewhere than with us adds to our anxiety. It was not surprising, therefore, that the Scottish Gas Board sought to recruit graduates with suitable degrees and prescribed a scheme of post-graduate training. The primary responsibility lies with the Board to make provisions for recruitment, but it is a responsibility which we have to share by offering what help we can and by constructive suggestion.

It cannot be said that in the industry the avenues of promotion are few and far between, as the opportunities are determined by the need, which is greater than ever before. But is this really known?

In the past the gas industry in Scotland did not give country-wide publicity to careers and opportunities, due, no doubt, to the many undertakings having their particular needs satisfied from the local market. It was noticeable even then that in certain medium sized undertakings the number of technicians trained and sent forth was markedly high and, relatively speaking, still is. It was also of note that in every such instance the undertaking had a higher degree of local importance and the manager was recognised as a person of standing in the community. The local influence is not gone, but, with training schemes promoted by other industries receiving wider publicity, it is less effective. It is against the attractive publicity of industrial firms with long experience in recruitment and training that we have to display our offer, and surely, under one control we are in a good position to do so. Our publicity must match that of experienced firms.

A sound basic training in an industry where there is scope for promotion is the best investment a young man can make today, and we must stress the opportunities which exist in our industry. Progress will be recorded only when prospective entrants enquire about us.

What I have written in no way detracts from the progress made thus far; indeed, what has been done is the foundation and, I am sure, is viewed by the Board as such.

Coal

The gas industry, like other coal users, is not now in a position to choose. In the present circumstances of short supply and abnormal demand controlled distribution is essential for fair sharing of quantity, and, on the whole, the results are not unreasonable. It is to be regretted, however, that in exercising control the Government has not made fuller use of the opportunities offered whereby direction based on quality could have been realised to a greater extent with a substantial contribution to fuel efficiency. The absence of a clear and decisive policy hinders planning and does not encourage decisions to be made on industrial plant of high capital cost when the future operation of the plant is dependent on unspecified qualities of fuel.

The carboniser's two chief problems are quality and characteristic or type—*e.g.*, coking quality. Quality, as understood by the terms selection, grading, and removal of inert material, is the undivided and accepted responsibility of the National Coal Board, and without relieving them of its responsibility it is well that we should remember that plant renewals are no easier for the N.C.B. than for us. It is, however, a peculiar 'conditions of sale' that any reduction in quality imposes a penalty not on the producer but on the consumer who, in our case, is the gas and coke consumer. The increases since 1939 of inert material, irregular sizing, and changing sources of supply are well known.

A survey of the coal deliveries to Glasgow from 1939 to 1951 reveals some astounding facts. The tests were made on selected coals from various Scottish coalfields, in relation

to tonnage carbonised and continuity of supply. In 1939 there was no appreciable tonnage of Fife coals, the main supplies coming from Lanarkshire and to a lesser extent from the Lothian and Ayrshire fields. From 1946 onwards the supply from Lanarkshire worsened and an increasing number of poorer gas-making coals were delivered from other areas.

The points to be noted are:—

(1) The minimum to maximum ash content over all coals in 1939 was 3.5% and rose in 1951 to 11.3%.
(2) The average ash content of coal delivered to the Scottish gas industry in 1951 was 8% to 9%, while the ash content of the coals surveyed in 1951 shows a range from 5.2% to 16.5%.
(3) The maintenance of quality in some coals is marked, while the deterioration in others is severe.
(4) With few exceptions, there is a progressive reduction in thermal yield and swelling index and an increase in ash content, particularly in the coals from the areas of Central West, Central East, and Ayr-Dumfries.

It is reasonable to suggest that the deterioration in quality, as received, is due more to bad picking at the tables and screening and selection at the pithead, and not to change in the inherent quality. Mechanisation of coal extraction and improved methods of preparation are part of the 'Plan for Coal' and must be developed simultaneously if the product is to satisfy the markets.

Additional to the disturbing effect of increased inert material is the continuing reduction in coking quality. To illustrate, the undernoted is a review of coal deliveries to Provan works, Glasgow, since 1939 to date, and is based on test plant results applied to total annual tonnages carbonised.

	1939	1943	1946	1950	1951
Average S.N.	4	4½	3½	3	2½
Maximum S.N.	7½	8½	7	6	6
Minimum S.N. ...	1(N.A.)	1(A.G.)	1(N.A.)	1(N.A.)	1(N.A.)
Therms/ton (coal test plant)	69	68	68	66.5	65
Coke-ash (dry basis) ...	9.0	11.1	9.4	10.4	11.2
Breeze-ash (dry basis) ...	15.5	14.1	16.0	18.6	18.9

The latest information points to further and more severe cuts in supplies of coking coal due to the increasing needs for metallurgical coke, a demand to be satisfied from a diminishing source. The impact of this change will be felt more in Scotland than in areas south of the Border where the coals for gas-making are drawn from the higher ranges of coking quality, and the anticipated reduction in swelling power will not be such as will exclude these coals from use in static carbonisation.

Carbonisation in Scotland

Compared with England, there is a marked predominance of continuous vertical installations in Scotland. Not the least of many reasons why this should be is the ability of the continuous vertical retort to handle Scottish coals. It can be said that in Scotland the practice of carbonisation is to steam down in continuous vertical retorts to the declared C.V. with the addition of carburetted water gas for peak loads. When by direction or circumstances this pattern has been altered, the departure from the basic practice has been looked upon as a temporary expedient.

We may be content with this pattern, but to have some good reasons why we are content is much more satisfactory. It is well, therefore, that the position should be reviewed, and what I write is drawn from my own experiences and those of others.

The Glasgow division, while small in number of units, contains the extremes in size and output. Thus plant extensions call for flexibility of outlook. The Glasgow district in itself, with an annual output of 14,000 mill. cu.ft. and a high potential demand, is in a position usefully to employ any type of plant without the restriction of the lower economic limit of size. To satisfy the potential demand all the generally accepted types of carbonising units have been considered *vis-à-vis* coals available, and this, together with extensions in the division, forms a survey applicable to Scotland generally. It is from these deliberations that I write and although part of them did not progress beyond planning and part is in retrospect, unlikely to be repeated, it makes a no less interesting and a more complete picture.

Coke Ovens

The development and use by the gas industry in England of coke ovens of narrow dimensions operating at higher temperatures and shorter coking periods permitted the introduction into the coal blend of a greater percentage of inferior swelling coals, and coke ovens appeared, therefore, to be of use to Glasgow as a base load plant.

Investigations started early in 1950 and at that time there was a reasonable assurance that deliveries of coking coals would be maintained but not increased. Accepting this assurance, it was obvious that additional demands for town gas would require to be met from supplies of lower coking coals. As Glasgow had a weekly allocation of some 7,000 tons of coals with a S.N. of 3 and over, it was possible that re-distribution of coals within Glasgow could advance the case of coke ovens as a base load plant, provided the quantity of these coals could be maintained over a period of years sufficient to repay capital outlays.

Preliminary capital costs were taken and, based on 300 full working days, the comparative annual capital charges (8%) for alternative types of plant were:—

On 450 B.Th.U. per cu.ft.	Output per day mill. cu.ft.	Capital per mill. cu.ft.	Capital per therm.
Coke ovens and blue water gas	21.73	£58,674	0.835d.
Coke ovens and producer gas	16.72	£67,284	0.957d.
Continuous vertical retorts and carburetted water gas ...	20.00	£83,950	1.194d.

In 1951 when preparations were being made for large scale tests, it was learned that further installations of coke ovens in the steel industry were being planned, with a consequent increased demand on the available coking coal, including, in all probability, part of Glasgow's allocation. In this air of uncertainty there was little purpose in continuing tests and the advantage of a lower priced therm from that type of plant was denied us. That it may come in part from the coke ovens when the surplus gas is available is another matter.

The only installation of intermittent vertical chambers in Scotland is at Dawsholm gasworks, Glasgow, and is part of a unit combining continuous vertical retorts to provide the diluent to adjust to the declared calorific value. It is most unlikely that coal qualities will allow of further installation of I.V.C.'s. One point of significance in intermittent vertical chamber practice is that the contraction of the charge when 'coked' does not permit efficient steaming and, therefore, as a single unit is not attractive to Scottish practice.

Horizontals

Horizontals are confined mainly to the smaller undertakings where the incidence of capital cost of alternative systems is high in relation to the total output. The continuation or extension of horizontals in medium sized undertakings can be justified only where existing useful production plant is taken into the computation of costs and the dilution of the cost of the new by the lower capital charges on the existing plant makes the proposition economically attractive.

With calorific values of 450 and lower, horizontals do not allow for production of the declared calorific value without continuous operation of diluent plant. The advantages of flexibility by alteration in load between both plants for the most economical therm are, therefore, restricted as compared with steaming in continuous verticals with complementary or diluent plant.

(*Continued on p. 327*)

Rising costs have imposed a heavy burden on the small horizontal undertaking and for many their existence is secured only by the provision of a ceiling selling price of gas. Production of under 20 mill. cu.ft. per annum does not permit full technical control of quality to the standards desired and maintenance of pressure is the best that can be achieved in some instances.

The report on the butane-air experimental plant at Whitland, Wales Gas Board, appears to offer a solution to the problem of small undertakings out of range of physical integration.

Continuous Verticals

The installed capacity of this system is approximately 70% of the total effective capacity in Scotland and, therefore, calls for more comment. Any improvement in design or alteration in practice will exert a greater influence than other types on the overall cost into holder in Scotland. The improved amenities associated with the use of continuous vertical systems need no emphasis.

In the years between the wars there was a rapid increase in continuous vertical retort installations, which replaced static carbonising systems. The continuous vertical, being more selective to coal, forced re-declarations of lower calorific values. The adjustments made were without common formula or specification and were stepped from 375 B.Th.U. upwards. With gas outputs around 1930 remaining steady and subsequent additions to sales being small, there was elbow room to take a choice and pursue it within the effective capacity of existing plant, 25% excess at peak load being regarded as normal. Plentiful supplies of particular coals at low cost encouraged the advocates of higher C.V.s, 475 upwards, to seek increased revenue from residuals while adherents to low C.V.s sustained their arguments on maximum therms per ton. The determination of the calorific value was governed in the upper ranges by the quality of coal and its behaviour in the retort, and in the lower ranges by distribution considerations. If additional plant was necessary the annual charges, usually met to some extent by completion of redemption on some former plant, were not such as to warrant any change of calorific values.

After 1939, further lowering of calorific values was compelled by the reduction in coal qualities. Later, the excess capacity being absorbed by additional war-time demands, the maximum thermal output per unit of plant assumed greater importance when extensions became inevitable. Today, the continuing rising costs together with restrictions in capital and steel, all likely to be with us for many more years, necessitate a closer study of the influence of capital on production costs, and this is further stressed by integration of undertakings with different calorific values. It is well known that there are districts or regions within Scotland where 50 B.Th.U. separate the highest from the lowest calorific values—in some instances between contiguous undertakings using similar coals. In each of these undertakings the distribution systems have been designed for a declared C.V. and any adjustment must take cognisance of this fact.

I do not claim to be able to give you the answer, but, having had the problem before me for some time, I have given it a great deal of thought, and I hope, in reviewing the study, there will be some contribution of value to those similarly occupied.

There are 79 installations of continuous vertical retorts in Scotland producing a weighted average calorific value of 430 B.Th.U., and I divide them into two groups:—

(a) Undertakings with continuous vertical retorts and no complementary plant.
(b) Undertakings with continuous vertical retorts and carburetted water gas or diluent plant.

If we consider the first group, then our approach to the second will be easier.

An undertaking of group (a) starting afresh and given a free choice would today declare a calorific value at the lowest net cost of production within the range of maximum thermal output per unit of plant. From authoritative tests under actual working conditions and a cross-section of opinion from everyday practice, this range appears to extend over some 25 B.Th.U. in Scottish practice and at a lower calorific value zone than in England, where highly coking coals are available.

Let us go back to the last and probably the most authoritative full-scale tests on the carbonisation of Scottish coals in continuous vertical retorts, undertaken specifically to determine the most economic therm under the conditions of that day. I refer to the work done by the late James Jamieson, of Edinburgh, and reported in the 1932 Transactions of the North British Association under the title 'Calorific Values and Their Relation to Working Results and Costs.'

The tests were conducted in a setting of four nominal 80 in. rectangular retorts. The coal used was not of the best to be obtained at that time and not far removed from the average quality now supplied to the Scottish gas industry. The thermal yields then obtained have never been reached in everyday practice, but it must be understood they were achieved while using one coal and everything at test plant standard. The tests nevertheless produced sufficient evidence on which to found the declared calorific value.

The main points revealed in the paper and discussion were:

(1) That 500 B.Th.U. gas was, so to speak, at the end of the calorific tether for production.
(2) The lower limit of calorific value of 400 B.Th.U. was at the end of the calorific tether for distribution.
(3) For all practical purposes the maximum thermal output per unit of capital plant was achieved at 450 to 425 B.Th.U. and within that range the lowest net cost therm was made at 450 and, therefore, the lowest gross cost therm.
(4) As the selling price of coke moved down towards that of coal and below it, and as the price of tar moved up, the incidence of additional cost on the net therm was less at the lower calorific value, and therefore favourable to it.

Comparisons with 1926

Compare the effects of coal charges and revenue from residuals in 1926 with today, excluding 500 and 475 values, which are above the calorific limit of present-day coals.

	Coal/ton	Selling price of coke per ton	of breeze per ton	Tar per gal.	Steam per 1,000 lb.
1926 ...	17s. 5d.	18s.	7s. 6d.	2d.	1s. 6d.
1952 ...	70s.	75s.	32s. 6d.	5d.	4s.

The net cost of production of gas in pence per therm (dry coke basis):—

C.V		450	425	400
1926	...	1.19	1.24	1.31
	Ratio	1:1	1:1.04	1:1.10
1952	...	5.29	5.47	5.78
	Ratio	1:1	1:1.03	1:1.09

The foregoing does no more than confirm the findings of the author and indicate the effect of residual revenue *vis-à-vis* coal. The basis of the case, then as now, was maximum thermal output per unit of plant, and with the increase in wages and other charges it is of interest to examine the effect of these costs on the net cost of production in 1952. The charges shown are Glasgow's and exclude capital:—

COAL—

Add cost of coal d/d hoppers @ 6.76d. per ton
plus repairs to coal handling plant @ 3d. per ton
= 70s. 9.79d. per ton.

COKE—

Average net price for coke after deducting 2s. per ton for handling and repairs to coke plant, and 3s. per ton for marketing = 70s. per ton.

Breeze and tar (unaltered)

C.V	450	425	400
1952 ...	5.52	5.64	5.93
Ratio	1:1	1:1.02	1:1.06

Within the range of maximum thermal output established by Jamieson there is now a marked closing of the costs gap between 450 and 425 and although we cannot assess precisely the effect of other changes we can indicate the direction.

The impression grows that practical considerations as well as financial circumstances will force a movement towards calorific values lower than 450 for Scottish undertakings.

There is, however, another feature of Scottish carbonising which makes the lowering of calorific value not so difficult in practice. The reactivity of Scottish cokes, at high temperature, to steam is marked and increases with decrease in coking power. The result will be that steaming can be effectively increased and a higher percentage of blue water gas produced in the retort. However, the extent to which steaming can be carried appears to be, among other things, a function of retort size.

Three Examples

To illustrate, I give three examples taken from actual working conditions:—

(1) The installation of 100-in. continuous verticals at Dawsholm, carbonising graded coals with under 1 in. rejected, steams efficiently and maintains the thermal output from 460 to 430 B.Th.U.

(2) An installation of 80-in. continuous verticals, not in Glasgow, reveals the lower effective limit of steaming at 435 B.Th.U.

(3) An installation of 33-in. continuous verticals can maintain the maximum thermal output down to 405 B.Th.U., but at 445-450 there is a loss in therms per ton not compensated by therms per retort.

All three installations operate on Scottish coals of similar types, and there appears to be an economic range of calorific values for each size of retort; the larger the retort the higher the range. With the signs pointing to lower calorific values, it would be desirable to know just how far we should go and what size of retort yields the best results.

In my opinion, the answers can be found only by large scale tests and this will require time, staff, and money. Retort installations are erected for 30 to 40 years and with the high capital charges of today we must not confine ourselves to profits made in the retort house, but must have concern for net profits of production.

Of the undertakings in the second group—*i.e.*, with C.W.G. or diluent plant—there is greater flexibility, and the first query will be the reduction in thermal output of carburetted water gas units if the calorific value is lowered. Under average Scottish conditions a reduction of 20 B.Th.U. means approximately 5% to 6% loss in thermal output. If, however, the most economic range was found to be 440 to 420, the combined thermal output of both plants could be maintained with coal gas at 420 and 33% carburetted water gas at 450, giving a declared value of 430. This set of conditions would be desirable at peak to make the greatest use of existing capital but less necessary at other times.

The low coking coals in Scotland place a low ceiling on the upper limit of C.V.s and distribution problems control the lower limits, leaving a comparatively short range in which to operate.

After full consideration of the many limitations peculiar to Scottish practice which I have emphasised in this address, I see no better method of attaining our objective than the continuance of the traditional method of steaming in continuous vertical retorts to the required calorific value, with the addition of carburetted water gas to meet peak loads. There remains the need for field research to confirm or confute these views, and I submit that only after this has been done can we approach this problem with any degree of confidence.

Under the Gas Act, consultation between responsible boards is compulsory when additional carbonising plant is contemplated, and gas surplus to other industrial processes may be purchased and distributed by the gas boards. Such supplies are base load and require additional storage if the economics of the existing gasworks are to remain balanced to the total gas available for sale.

Gone is the pre-war conception of surplus coke oven gas, then looked upon as a marginal product of the coke ovens with selling prices fixed accordingly. Now the surplus gas is regarded as basic income and consequently a relatively higher price is sought.

Much has been written on the need for control, by the gas industry, of external coke oven gas supplies, either by extension of the Act or by joint ownership. Today there is greater justification for extension of control. Previously, gas undertakers safeguarded their position, to a degree, by the provision of plant as stand-by to coke oven supplies but, at the present time, there is little likelihood that materials would be forthcoming for this purpose.

Experience has shown that many coke oven producers have accepted, as their responsibility, the maintenance of supply, and to come within the Act would place no burden upon them. On the other hand, there has been occasion when the continuity of supply has been more than disappointing and had the salutary effect of the Act applied, all parties, and especially the gas consumer, would have benefited.

Residuals

The present fuel shortage ensures the ready disposal of coke and breeze and does not reflect the position that might obtain in a free market; indeed, one cannot say whether the consumer is forced by necessity or has the desire to employ coke and breeze. The danger lies in our being complacent.

The selling price of coke of present quality, relative to alternative fuels, may be too high to be sustained in unrestricted markets and the reducing contribution, since 1939, from coke and breeze to net costs of coal places the price of gas in a position more vulnerable to increases in coal prices.

In a commercial undertaking any movement towards stability of the selling price of the main product is an asset, and all efforts are directed towards this end. Admittedly, the greater use of coke for production of carburetted water gas is a contribution and tends to establish a minimum selling price but even by doubling the production of carburetted water gas there still remains for disposal some 800,000 tons of coke.

In Scotland, coke and breeze yield about 28% of the revenue from gas and by-products, and as their disposal is governed by statutory instruments, more indefinite in application than market trends, we are encouraged to examine the situation closely.

The practice of storing, in bulk, ungraded coke has been shown to disadvantage in recent years. The demands for breeze, nuts, or large coke rarely coincide, and to have a market for a particular grade and be unable to realise it means locking-up money which could be usefully employed in reducing the interest charges on working capital. Many undertakings stock in graded sizes; others do not, even although the provision of suitable plant of portable type calls only for low capital outlays.

It will be agreed that the grades from 1 in. upwards have a wider market and if we use, as far as possible, the lower grades for production within the gasworks a greater quantity of the larger sizes can be released for sale. Breeze burning in boiler furnaces is common practice, but invariably the best and largest coke goes to producers. The change from fireclay to silica refractories in existing settings with increased

(*Concluded on p. 331*)

coal throughputs and inferior coke from inferior coals have no doubt compelled this course of action. Nevertheless, wherever possible on existing plant and certainly on new installations excess over the normal grate area should be installed in both step-grate and mechanical producers to accommodate the use of ½ in. to 1 in. coke nuts.

It is desirable that we encourage the use of coke appliances of continuous burning type in preference to gas where a high winter peak load is to be met. If this can be realised the advantages would be two-fold by synchronising coke demand with production and improving the load factor on gas plant.

Each undertaking, through the area board, makes a financial contribution to technical research, the results of which must be applied to the district before any benefits will accrue. It must not be said of us, in these times of high fuel demand, that we are awaiting the enforcement of the recommendation made by the Government Departmental Committee on the use of smokeless fuels when we should be going part of the way by efforts from within.

Tar and tar products represent 5% of our gas and by-products revenue in Scotland. The main feature of the disposals is the marked increase in the demand for coal tar fuels and pitch for briquetting. Although the coal tar fuels are priced competitively with their petroleum counterparts, it is reasonable to assume that the returns from tar will be related more closely to the price of coal than was the case when the products were put to uses other than as fuel. The demand for all tar products exceeds the supply, a pleasant condition and one which we hope will continue.

Capital Expenditure

The financial structure of the gas industry is such that by far the greater part of the capital invested lies in large static units of plant of an anticipated life of 25 to 40 years; obviously the cost at date of erection is reflected in the price of gas over the period of years of repayment. Pre-war, each period of peak prices had a compensating trough, but today rising costs of capital plant have taken the mean of the modulation of prices to a higher level. It is confidently expected that increased efficiency and better deployment of capital will bring some financial benefits, but the total saving accrued will not be such as to nullify the increase. In addition, there is to be met the development retarded by war years, and the industry, to maintain the desired standards of efficiency on existing plant, must make provision for standby plant to allow essential repairs.

The Board of Trade Statistics of Financial Returns shows that from 1939 to 1948 the sales of gas by local authority undertakings in Scotland increased by 37.6 mill. therms or 31.9% while, over the same period, the annual charges for interest, sinking fund and repayment of loans fell from 1.197d. to 0.772d. per therm sold, despite a rising price market. Had those increased outputs occurred in peacetime, there is little doubt that equivalent capacity would have been provided. To do so today, on an improved load factor of 68.5%, requires £6.93 mill., works plant now costing £200,000 per mill. cu.ft. per day at a weighted average calorific value of 434 B.Th.U. Local authorities alone supplied 85% of the gas in 1939 and, therefore, the total cost becomes £8.14 mill. On gas sold the estimated capital required is on the £9 mill. mark or 3.8d. per therm against little more than £3 mill. or 1.37d. per therm in 1939. The foregoing does not include capital for distribution or renewals of existing plant and to the figures given must be added the monies required for new loads.

It is true that the outstanding loan debt of local authority undertakings in Scotland provided a low basis on which to develop and build, and for many years a lower priced therm will obtain. The new capital outlays, however, are of greater proportion to the lower Scottish basis than to those of higher capital at the date of take-over. Anyone comparing today's with pre-war charges should bear this in mind.

There is little prospect of the restricted capital development exceeding the demand for many years to come and when gas prices embrace their real share of the higher capital repayments it may be that the potential demand can be forecast with an accuracy not possible at the present time. Until then we must budget for the increasing demands as they are presented to us lest we depress and weaken our position as a supplier of fuel in this country.

A practical example of the benefits of interlinking can be seen at the undertakings nearest to this meeting place. Dumbarton, with an exceptionally high annual load factor of 86% to effective capacity, could not effect essential repairs or meet peak demands without additional plant, and to install that plant would have called for a minimum expenditure of £100,000. Helensburgh and Vale of Leven, with surplus plant and annual load factors of 58% and 46% respectively, were in a position to assist by taking over the supply in the areas adjacent to their boundaries. The benefits did not stop at meeting the demand but went much further. As separate undertakings and with the extension at Dumbarton the annual sales would have totalled 1,053 mill. cu.ft. with capital charges of 2.04d. per therm. With the undertakings integrated the same output has been achieved with capital charges reduced to 1.57d. per therm. The immediate saving in annual capital charges alone amounts to £8,000, with an improved load factor in each undertaking.

Load Development

The production programme for works feeding into a common distribution system is a matter for decision based primarily on financial considerations. Today the financial benefits to be obtained from the improvement of the load factor of capital plant are such as warrants the correlation of the disposals of gas and by-products under a carefully planned policy. I gave £200,000 per mill. per day as representing today's costs for works extension, and if this is set against the various types of consumers the effect of an improved load factor is at once apparent.

£200,000 at 8% per annum interest and depreciation—£16,000 annual charges—C.V. 434 B.Th.U.

Classification.	Load factor p.a. maximum days.	Capital made.	Cost per therm sold.
Industrial	300	2.95d.	3.17d.
Commercial ...	275	3.22d.	3.46d.
Domestic	220	4.02d.	4.32d.
Scottish area (1950-51)	256	3.46d.	3.71d.

Scotland, with a highly industrialised belt, sells only 26.54% of the total gas sales to industrial and commercial consumers as compared with 36.58% for the total of the 12 combined area boards. It would be well for Scotland to consider whether or not the fullest use of capital is being made.

National Fuel Policy

Fuel technologists for long have preached the need for conservation of coal. Without thought for the future, our coal reserves have been expended at a rate far in excess of other coal producing countries and at a lower efficiency than in Europe and America. The mining industry has increased output, but the demand has risen to beyond its capacity. The remedy must be found by increased efficiency in its use. Within the fuel supplying industries there are loads accepted which could be carried more advantageously by alternative fuels resulting in a lower expenditure of coal and in some instances a lower capital outlay. The future prosperity of this country still depends on coal and we welcome the establishment of the Ridley Committee, whose duty it is to examine and report on the fuel situation in this country.

We must purchase abroad the things we need by the things we possess. Coal and its by-products are among the most sought-after exports and, to make greater quantities available a better application and fuller use must be made of the coals we have. This is a long term policy and the major difficulty will be the maintenance of the financial and economic structure of industry during the transition period. The gas industry is pre-eminently using coal to the best advantage, and this will serve to emphasise the benefits of further expansion in the carbonising industries of this country.